

# INDEX TO VOLUME 187

This index covers both the *Initial Reports* and *Scientific Results* portions of Volume 187 of the *Proceedings of the Ocean Drilling Program*. References to page numbers in the *Initial Reports* are preceded by "A" followed by the chapter number with a colon (A1:) and to those in the *Scientific Results* (this volume) by "B" followed by the chapter number with a colon (B1:).

The index was prepared by Earth Systems, under subcontract to the Ocean Drilling Program. The index contains two hierarchies of entries: (1) a main entry, defined as a keyword or concept followed by a reference to the page on which that word or concept appears, and (2) a subentry, defined as an elaboration on the main entry followed by a page reference.

The index covers volume text, figures, and tables but not core-description forms ("barrel sheets"), core photographs, smear slide data, or thin section descriptions. Also excluded from the index are bibliographic references, names of individuals, and routine front matter.

The Subject Index follows a standard format. Geographical, geologic, and other terms are referenced only if they are subjects of discussion. A site chapter in the *Initial Reports* is considered the principal reference for that site and is indicated on the first line of the site's listing in the index. Such a reference to Site 1152, for example, is given as "Site 1152, A3:1–31."

## SUBJECT INDEX

### A

- Acinetobacter junii*, microbial populations, B6:6, 10
- actinolite, alteration, A13:10; B1:7–8
  - high-temperature alteration, B5:8
  - lithologic units, A13:3–4
  - petrography, A13:5
  - photomicrograph, A13:16, 20–21, 29, 31; B5:21
  - scanning electron backscattered electron images, B7:20
- actinolite, fibrous
  - alteration, A1:11
  - photomicrograph, A13:30
- age, vs. natural remanent magnetization, B7:14
- aggregates, basalt, A1:9
- albite, alteration, A13:8; B1:7–8
- albite twinning, petrography, A12:4; A15:5
- alteration
  - basalt, A1:9–11; A15:7–9; B1:6–9
  - correlation coefficients, B5:27–29
  - geochemistry, B5:8–11, 25
  - greenschist facies, A13:7–8
  - isocon plots, B1:28
  - mass change terms and alteration intensity, B5:26
  - photograph, A11:26; A13:33
  - photomicrograph, A4:9; A7:18, 25; A9:19; A12:23–24
  - pillow basalt, A4:3–4; A5:3–4
  - remanent magnetization, B7:8
  - Site 1152, A3:7–8
  - Site 1153, A4:3–4
  - Site 1154, A5:3–4
  - Site 1155, A6:5–7
  - Site 1156, A7:5–8
  - Site 1157, A8:7–8
  - Site 1158, A9:5–7
  - Site 1159, A10:3–4
  - Site 1160, A11:7–10
  - Site 1161, A12:8–9
  - Site 1162, A13:7–11
  - Site 1163, A14:4–5
  - Site 1164, A15:7–9
  - See also* halos; hydrothermal alteration; maghemitization; oxidation; palagonitization; recrystallization
- alteration, high-temperature, greenschist facies, B5:8
- alteration, low-temperature
  - basalt, A1:9–10; A6:5–7; A13:9–10; A15:8–9; B5:1–29
  - lithologic units, A7:5–8
  - pillow basalt, A5:2–3
- alteration facies, composition, A11:8–10
- alteration Facies I, composition, A11:8–9
- alteration Facies II
  - composition, A11:9–10
  - photograph, A11:16
- alteration front
  - photograph, A1:36; A3:20
  - photomicrograph, A1:37, 39; A6:29
- aluminum, alteration, B5:9
- aluminum oxide
  - alteration, B1:7–8
  - basalt, A3:10; A6:10–11; A7:11; A8:11; A9:8–10; A10:5–6; A11:12–13; A13:14
  - melting regime, B1:14–15
  - vs. magnesium oxide, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42; B1:35
  - See also* calcium oxide/aluminum oxide ratio
- anorthite, composition, B2:4
- aragonite, photomicrograph, A6:28; B5:19
- Australian Antarctic Depth Anomaly
  - dynamics, B1:18–21
  - evolution, B1:1–40
  - origin, B1:2–3

- Australian Antarctic Discordance  
 dynamics and origin, B1:16–19  
 evolution, B1:1–40  
 geology, A1:1–49  
 lead-206/lead-204 ratio vs. longitude, A1:41  
 mantle heterogeneity, B3:1–24  
 petrogenesis, B2:23
- Australian Antarctic Discordance Segment 4, mantle domains, A14:8
- Australian Antarctic Discordance Segment 5, mantle domains, A15:11–12
- Australian Antarctic Discordance Segment B4, domain distribution, A1:14
- Australian Antarctic Discordance Segment B5, domain distribution, A1:14
- Australian Antarctic Mantle Anomaly, origin, B1:2–3
- B**
- Bacillus/Clostridium* group, microbial populations, B1:6; B6:7
- bacteria, iron-oxidizing, microbial populations, B6:8
- barium  
 basalt, A1:12; A6:10–12; A7:11; A8:11; A11:13; A12:11; A14:8  
 geochemical signals, B1:16–19  
 isotopic boundary, B1:4–5  
 mantle domains, A1:13; A13:14  
 pillow basalt, A4:6–7; A5:7  
 vs. lanthanum, B1:36  
 vs. magnesium oxide, A3:25; A4:18; A5:18; A6:37; A7:34; A8:52; A9:22; A10:25; A11:36; A12:42; A13:42; A14:29; A15:43  
 vs. zirconium, B1:36  
 vs. zirconium/barium ratio, A1:4–5, 43–44; A3:26; A4:19; A5:19; A6:38; A7:35; A8:53; A9:23; A10:26; A11:37; A12:43; A13:43; A14:30; A15:44; B1:32  
 Zone A, A8:12  
*See also* zirconium/barium ratio
- barium/zirconium ratio, mantle domains, A4:7; A5:7
- basalt  
 abundance in breccia, A7:27  
 alteration, A3:7–8; A8:8; A14:4–5; A15:7–9; B1:6–9  
 geochemistry, A3:31; A4:22; A5:22; A6:41–42; A7:38–39; A8:56; A9:26; A10:29; A11:41–42; A12:47; A13:46; A14:33; A15:48  
 low-temperature alteration, A13:9–10; B3:1–29  
 magnetic properties, B1:9–10; B7:1–25  
 mantle heterogeneity, B3:2–4  
 microbial populations, B6:1–27  
 petrogenesis, B2:23  
 petrography, A1:8–9; A8:5–6; A12:6–7; B2:13–15  
 petrology and geochemistry, B1:10–19  
 photograph, A4:12; A7:28, 30; A8:33, 39; A10:13; A11:22–24; A14:19–21, 24  
 photomicrograph, A8:42; A9:18; A14:22  
*See also* clay/basalt contact; pillow basalt
- basalt, altered, abundance, A15:46
- basalt, aphyric  
 lithologic units, A3:4–6; A6:4–5; A8:3–7; A9:3–5; A10:2–3; A11:3–4; A12:3–8; A14:3–4; A15:3–7  
 petrography, A13:4–6; A15:5–6  
 photograph, A4:11; A11:20; A12:15, 18, 25, 29; A14:10–11, 23; A15:13, 20–21, 28–30  
 photomicrograph, A8:16; A12:23, 27; A14:13–16; A15:31, 36
- basalt, aphyric massive, lithologic units, A11:4–5
- basalt, holocrystalline, photograph, A3:14
- basalt, massive  
 petrology, A1:7  
 photograph, A1:23; A11:16, 29  
 photomicrograph, A11:31
- basalt, microcrystalline aphyric  
 petrography, A12:7  
 photograph, A1:27
- basalt, phyric  
 lithologic units, A12:7–8  
 petrography, A13:4–6  
 photograph, A1:36
- basalt, plagioclase phyric, lithologic units, A13:4
- basalt, plagioclase-olivine aphyric, photograph, A12:14
- basalt, plagioclase-olivine phyric  
 lithologic units, A6:3–5; A7:4–5; A8:3–7; A9:3–5; A11:5–6; A12:3–8; A14:3; A15:4–7  
 petrography, A12:3–8; A13:4–6; A15:4–6  
 photograph, A1:31; A8:24, 27, 31; A12:13, 16–17, 20, 26; A13:24, 33; A15:18, 22  
 photomicrograph, A12:28; A15:35
- basement, lithologic units, A15:3–7
- bathymetry, residual depth anomaly, A1:46
- bedding, dip, A8:10
- biodegradation, volcanic glass, A6:30
- biosphere, subsurface  
 exploration, A1:5  
 microbial populations, B1:5–6
- box texture  
 lithologic units, A9:3–5  
 photomicrograph, A9:12–14
- breccia  
 alteration, A1:10  
 calcite and basalt abundance, A7:27  
 high-temperature alteration, B5:8  
 lithologic units, A12:3–8; A14:4  
 petrography, A8:4–5; A12:5–8  
 petrology, A1:8  
 photograph, A15:20–21
- breccia, basalt-carbonate, lithologic units, A8:3–7
- breccia, basaltic  
 alteration, A12:8–9  
 lithologic units, A15:4–7  
 petrography, A15:6–7  
 photograph, A1:25; A7:30; A8:14; A12:21, 29, 32, 34; A15:28–30  
 photomicrograph, A12:22, 24, 27–28, 30, 33; A15:31–32, 39
- breccia, calcareous, photomicrograph, A8:21–23
- breccia, calcareous-clay cemented hyaloclastite, photograph, A14:10
- breccia, calcite-cemented basaltic, photograph, A14:17–18
- breccia, carbonate-cemented basalt, photograph, A7:17
- breccia, dolomite-cemented basalt  
 lithologic units, A13:4–7  
 petrology, A1:8

photograph, A13:34, 36  
 photomicrograph, A13:22–23  
 breccia, glass-rich, photograph, A12:31  
 breccia, hyaloclastite, photograph, A10:7  
 breccia, posteruptive carbonate-cemented, petrology, A1:8  
 breccia, talus, lithologic units, A7:3–5  
 breccia, volcanic, petrology, A1:8  
 brecciation  
   lithologic units, A7:4–5  
   photograph, A7:28  
 brittle deformation, alteration, A13:9

## C

calcarenite  
   lithologic units, A14:4  
   petrography, A8:4–5  
   photograph, A8:18  
   photomicrograph, A8:20  
 calcite  
   alteration, A4:3–4; A8:7–8; A11:8–10; A12:8–9; A14:4–5; A15:7; B5:7  
   alteration generations, A7:5–8  
   petrography, A8:4–6  
   photograph, A4:12; A7:22; A11:24, 29–30; A14:10  
   photomicrograph, A6:16, 23, 26; A8:15, 20, 46; A15:14, 17, 26, 33–34; B5:16, 18, 19  
   precipitation, A8:8  
 calcite, cryptocrystalline, alteration, A1:11  
 calcite, first-second generations, abundance, A7:27  
 calcite, high-magnesium, geochemistry, A13:14  
 calcite, micritic  
   abundance in breccia, A7:27  
   petrography, A8:7  
   photograph, A6:26–27; A7:17, 20–21, 28; A8:19, 33  
   photomicrograph, A6:27; A8:37; A14:22  
 calcite, recrystallized, photomicrograph, A8:36–37, 40  
 calcite, secondary, petrography, A8:4  
 calcite, sparry  
   alteration, A11:9–10  
   petrography, A8:7  
   photograph, A6:26; A7:20; A14:21  
   photomicrograph, A8:37–38, 40; A14:22  
 calcium oxide  
   alteration, B1:7–8  
   basalt, A3:10; A7:11; A10:5–6; A13:14  
   melting regime, B1:14–15  
   pillow basalt, A4:7  
   vs. magnesium oxide, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42; B1:35  
 calcium oxide/aluminum oxide ratio  
   basalt, A3:10; A6:11; A8:11; A9:8–10; A11:12–13; A12:11; A14:7–8  
   olivine, B2:5  
   pillow basalt, A5:7  
   vs. magnesium oxide, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42; B1:35; B2:20  
 Zone A, A8:12

carbon dioxide  
   enrichment cultures, B6:6  
   submarine basaltic volcanic glass, B4:3  
   vs. water content, B5:6  
 carbonate compensation depth, sediments, A4:6  
 carbonates, alteration, A4:3–4  
 carbonates, micritic, lithologic units, A7:3–5  
 cataclasite  
   alteration, A1:11; A13:8–9  
   lithologic units, A13:4  
   petrography, A13:5  
 cataclasite, basaltic, photograph, A13:32, 38  
 cavities, calcite-filled, photograph, A4:11  
 cavities, lithologic units, A13:6  
 cavities, miarolitic  
   lithologic units, A14:3  
   petrography, A8:4–6; A15:5–6  
   photomicrograph, A8:15, 28–29; A12:17; A14:15; A15:25–26  
 cesium, alteration, B1:8  
 chalcopyrite  
   alteration, A12:9  
   photomicrograph, A12:40  
 chilled margin  
   alteration, A9:6–7; A11:9–10; A12:8–9; A13:10–11; B5:7  
   lithologic units, A9:3–5; A10:2–3; A11:4–7; A13:3–7; A14:3; A15:4–7  
   petrography, A8:4–6; A12:5; A15:6  
   photograph, A1:22; A1:34; A3:14; A8:14, 31; A10:8, 17; A12:20, 22, 29, 37; A13:36; A14:9–10, 16; A15:18, 27, 30  
   photomicrograph, A12:27–28, 30; A13:16, 22  
 pillow basalt, A4:3; A5:3  
 chilled margin, glassy, photomicrograph, A8:30  
 chilled margin, spherulitic, photograph, A8:17, 19  
 chloride  
   submarine basaltic volcanic glass, B4:3–4  
   vs. potassium, B4:7  
 chloride/potassium ratio, submarine basaltic volcanic glass, B4:4  
 chlorite  
   alteration, A1:11; A11:9–10; A13:8–11; B1:7–8  
   high-temperature alteration, B5:8  
   lithologic units, A13:3–4  
   petrography, A13:5  
   photograph, A11:16, 29  
   photomicrograph, A8:36; A11:28; A13:16, 21, 25, 27, 29  
 chlorite layers, dolomite, A13:9  
 chrome spinel  
   basalt, A1:8–9  
   lithologic units, A6:4  
   petrography, A15:5  
   photomicrograph, A6:19–20  
 chromium  
   basalt, A3:9; A6:10–11; A7:11; A8:11; A9:8; A10:5; A11:12; A14:7; A15:11  
   vs. magnesium oxide, A3:25; A4:18; A5:18; A6:37; A7:34; A8:52; A9:22; A10:25; A11:36; A12:42; A13:42; A14:29; A15:43

- chromium oxide, alteration, B5:10
- clast/matrix ratio, breccia, A13:9–10
- clast matrix, petrography, A13:6
- clasts
  - alteration, A12:8–9
  - high-temperature alteration, B5:8
  - lithologic units, A13:4–7
  - petrography, A13:4–6
  - photograph, A10:7; A15:20
  - photomicrograph, A8:21
- clasts, altered basaltic, photomicrograph, A13:22
- clasts, aphyric pillow basalt, photograph, A15:27
- clasts, basalt
  - lithologic units, A13:6–7
  - petrography, A12:5–7
  - photograph, A1:25–26; A7:13, 20–21; A8:14; A12:22, 32; A14:10, 17–18; A15:21
  - photomicrograph, A8:41; A12:27–28, 30, 33, 36; A13:37
  - summary, A12:45
- clasts, basalt–micritic limestone, lithologic units, A7:4–5
- clasts, basaltic glass, photograph, A12:32
- clasts, basaltic rubble, petrography, A8:3–4; A12:3–4
- clasts, breccia
  - alteration, A1:11; A13:7–8
  - lithologic units, A8:3–7; A12:7–8
- clasts, calcite, photograph, A7:22
- clasts, clay
  - photograph, A12:29
  - photomicrograph, A12:27
- clasts, epidote, lithologic units, A13:4
- clasts, feldspar, photograph, A12:22
- clasts, glassy basalt, photograph, A12:34
- clasts, lithic
  - alteration, A14:4–5
  - petrography, A15:6–7
  - photograph, A14:21
  - photomicrograph, A8:38
- clasts, palagonite
  - lithologic units, A7:4
  - petrography, A12:5–6
  - photograph, A7:20; A12:29; A13:34
  - photomicrograph, A8:22–23; A12:36; A13:23
- clasts, plagioclase–olivine phyric basalt, photograph, A8:18
- clasts, polymict basalt, lithologic units, A7:3–5
- clasts, volcanic glass, petrography, A12:5–6
- clay
  - alteration, A5:4; A8:7–8; A10:3–4; A11:7–10; A12:8–9; A13:10–11; A14:4–5; A15:8–9; B1:7–8
  - composition, A7:9–10; A9:8; A14:6–7; A15:10
  - lithologic units, A11:4–7; A15:3–7
  - petrography, A8:3–4, 7; A13:5
  - photograph, A8:19, 32; A10:7, 13, 17–18; A12:34, 37, 39; A13:36; A14:10; A15:30, 35, 37
  - photomicrograph, A8:20, 29, 34–36; A10:10–11, 14–15; A11:28; A12:18, 22, 33, 35; A13:19; A14:13–15; A15:32, 36
  - pillow basalt, A5:3
  - Sedimentary Unit A, A4:5
  - sediments, A5:6
  - clay, calcareous, lithology, A6:9
  - clay, carbonate-rich, composition, A10:5; A11:11–12; A15:10
  - clay, micritic, photograph, A14:24
  - clay, siliceous
    - composition, A8:10–11; A12:10; A13:13
    - lithology, A6:8–9
  - clay, silty
    - composition, A11:11–12
    - sediments, A5:6
  - clay/basalt contact, photomicrograph, A8:35
  - clay minerals, alteration, A1:10
  - cleavage planes, photomicrograph, A9:19
  - clinopyroxene
    - alteration, A7:5–8; A13:8–11
    - basalt, A1:8–9
    - lithologic units, A3:5–6; A6:4–5; A9:4–5; A11:4–7; A14:3; A15:3–7
    - mid-ocean ridge basalt, B2:4
    - petrography, A12:4; A13:5
    - photomicrograph, A1:32; A3:15, 18; A7:25; A8:29; A9:16, 19; A11:14, 25; A12:17–18; A13:20–21, 27, 30, 35; A14:14; A15:14, 16, 25–26; B5:21
    - pillow basalt, A5:3
    - scanning electron backscattered electron images, B7:20
  - clinopyroxene, anhedral
    - petrography, A8:3–4
    - photomicrograph, A3:16; A5:13
  - clinopyroxene, elongate, photomicrograph, A8:28
  - clinopyroxene, euhedral, photomicrograph, A8:15; A14:15
  - clinopyroxene, granular, lithologic units, A11:4–5
  - clinopyroxene microphenocrysts, euhedral, photomicrograph, A15:15
  - clinopyroxene phenocrysts
    - alteration, B5:7
    - basalt, A1:8–9
    - petrography, A8:6
  - coercivity
    - basalt, B7:6
    - hysteresis ratios, B7:19
  - color, sediments, A6:35; A8:50
  - concretions
    - alteration, A8:7
    - photograph, A12:21
    - photomicrograph, A8:20
  - contamination tracers, microbial populations, B6:8, 27
  - cooling curves, mid-ocean ridge basalt, B7:4–9
  - cooling joints, lithologic units, A11:4
  - coring, summary, A1:47
  - correlation coefficients, alteration, B5:27–29
  - cracks
    - photograph, A12:39; A13:36
    - photomicrograph, A9:19; A12:19
    - See also* microcracks; shrinkage cracks
  - crystal fractionation, olivine, B1:14
  - cumingtonite, photomicrograph, A13:20, 30
  - Curie temperature
    - mid-ocean ridge basalt, B7:4–9
    - vs. natural remanent magnetization, B7:15

*Cytophaga/Flavobacterium/Bacteroides* group, microbial populations, B1:6; B6:7, 14–15, 17

**D**

Day plot, basalt, B7:6–7  
 deformation  
   basalt, A6:7–8  
   See also brittle deformation  
 demagnetization, alternating-field, basalt, B7:6, 17  
 demagnetization, thermal, mid-ocean ridge basalt, B7:4–9, 17  
 dendrites  
   alteration, A15:7–8  
   lithologic units, A13:6  
   photomicrograph, A6:29–30  
 dendritic texture, alteration, A7:5–8  
 depth anomalies, residual  
   bathymetry, A1:46; B3:15  
   isotopes, B3:5–6  
 diabase  
   alteration, A1:11; A9:6–7  
   lithologic units, A9:5  
   photomicrograph, A9:17, 19  
 dip, bedding, A8:10  
 dissolution, petrography, A8:7  
 DNA bands, microbial populations, B6:6–8, 13  
 dolomite  
   alteration, B5:7  
   geochemistry, A13:14  
   lithologic units, A13:6  
   matrix, A13:7  
   photograph, A13:34  
   photomicrograph, A13:22–23, 37  
 domain structure, basalt, B7:6  
 Dredge 10, mantle domains, B1:11–12

**E**

enrichment cultures, rocks, A3:30; A4:21; A5:21; A6:40; A7:37; A8:55; A9:25; A10:28; A11:40; A12:46; A13:45; A14:32; A15:47; B6:3–4  
 enstatite, composition, B2:4  
 entrainment model, mantle, B1:16–19  
 epidote, lithologic units, A13:4

**F**

fluid inclusions, lithologic units, A7:5  
 fracture + vein density  
   basalt, A6:7–8; A7:9; A8:9; A11:10; A13:12; A14:6; A15:7  
   hole core section, A7:29; A8:47; A14:25  
 fracture fillings  
   127°E Fracture Zone, mantle domains, B1:12, 18, 20–21; B3:5–10  
   alteration, A4:3–4; A7:5–8; B1:7–8; B5:7, 11  
   lithologic units, A6:5  
   petrology, A1:7–8  
   photograph, A1:24, 34–35; A6:14–15; A10:17; A11:29  
   photomicrograph, A11:28

fracture zones, mantle, B1:26  
 fractures  
   alteration, A6:5–6; A8:8; A9:7; A10:3–4; A14:4–5  
   basalt, A6:7–8; A7:9; A11:10  
   microbial populations, B6:9–10  
   photograph, A5:14; A6:24; A7:23; A11:22; A12:37, 39; A14:19, 24; A15:27  
   photomicrograph, A7:24; B5:20  
   structure, A13:12; A14:5–6

**G**

gabbro, alteration, A1:11  
 gamma *Proteobacteria*, microbial populations, B1:7; B6:6–10, 14–19  
 geochemical signals, entrainment model, B1:16–19  
 geochemistry  
   basalt, B1:10–19  
   Site 1152, A3:9–11  
   Site 1153, A4:6–7  
   Site 1154, A5:6–7  
   Site 1155, A6:9–12  
   Site 1156, A7:10–12  
   Site 1157, A8:10–12  
   Site 1158, A9:8–10  
   Site 1159, A10:5–6  
   Site 1160, A11:12–13  
   Site 1161, A12:10–11  
   Site 1162, A13:14  
   Site 1163, A14:7–8  
   Site 1164, A15:11–12  
 glass rinds  
   alteration, A4:4; A7:5–8; A11:7–10  
   lithologic units, A3:5–8; A9:3–5; A14:3–4  
   photograph, A14:9; A15:27  
   pillow basalt, A4:3; A5:2–3  
 glass shards  
   alteration, A15:9  
   petrography, A8:5  
   photomicrograph, A8:21, 38; A15:38–39  
 glomerocrysts  
   basalt, A1:9  
   lithologic units, A3:5–6; A6:3–5; A7:5; A9:3–5; A11:3–7; A14:4  
   petrography, A8:5–6; A12:3–8; A15:4–6  
   photomicrograph, A1:29; A7:16; A11:19; A14:12, 16; A15:24  
 glomerocrysts, olivine, photomicrograph, A9:15  
 glomerocrysts, plagioclase + olivine, photomicrograph, A8:25  
 glomerocrysts, plagioclase, photomicrograph, A13:19  
 Gondwana, lava, B1:19–21  
 grain size, groundmass, A9:5  
 gravity maps, satellite, mantle, B1:26  
 greenschist facies  
   alteration, A1:11; A13:7–8  
   high-temperature alteration, B5:8  
   lithologic units, A13:3–4  
 groundmass  
   alteration, A1:9–10; B5:7  
   basalt, A1:9

grain size, A9:5  
lithologic units, A3:5–7  
pillow basalt, A4:3  
groundmass, intersertal, photomicrograph, A5:13

## H

hafnium  
vs. distance, B3:17  
vs. lead isotopes, B3:19  
*See also* lutetium/hafnium ratio  
hafnium isotopes  
depth anomalies, B3:6–7  
mantle domains, B1:13  
values relative to Indian Ocean mid-ocean ridge basalt mantle/Pacific Ocean mid-ocean ridge basalt mantle boundary, B1:38  
vs. lead isotopes, B1:33  
vs. neodymium isotopes, B1:34  
halos  
alteration, A1:9–10; A6:5–6; A7:5–8; A8:8; A11:7–10; A12:8–9; A14:5; A15:8–9  
basalt, A10:3–4  
lithologic units, A7:4–5  
petrography, A15:6–7  
photograph, A1:40; A5:14; A7:17, 20, 23; A8:19, 39; A10:12; A11:20, 22, 26, 30; A12:29, 38; A14:18–21, 23–24  
photomicrograph, A1:37; A7:26; A11:28; A12:27; B1:27; B5:19  
pillow basalt, A5:3–4  
halos, concentric, photograph, A1:36; A3:20  
hematite  
alteration, A12:9  
photomicrograph, A12:40  
honeycomb texture, sediments, A8:10  
hyaloclastite  
alteration, A7:5–8; A10:4  
lithologic units, A14:4  
photograph, A10:18  
hydrogen sulfide, enrichment cultures, B6:25–26  
hydrothermal alteration, mineral assemblages, A13:10  
hysteresis loops, basalt, B7:6–7, 18  
hysteresis ratios, mid-ocean ridge basalt, B7:19

## I

iddingsite  
alteration, A5:4  
lithologic units, A6:4–5  
igneous petrology  
basalt, B1:10–19  
mantle domains, A1:48–49  
review, A1:6–9  
Site 1152, A3:4–7  
Site 1153, A4:3  
Site 1154, A5:2–3  
Site 1155, A6:3–5  
Site 1156, A7:3–5  
Site 1157, A8:2–7  
Site 1158, A9:3–5

Site 1159, A10:2–3  
Site 1160, A11:3–7  
Site 1161, A12:3–8  
Site 1162, A13:3–7  
Site 1163, A14:2–4  
Site 1164, A15:2–7  
inclusions  
lithologic units, A11:6–7; A13:3–4  
photomicrograph, A11:18; A12:16; A13:17  
*See also* melt inclusions  
Indian Ocean mid-ocean ridge basalt mantle isotopic province  
domain distribution, A1:14–16  
magnesium oxide vs. sodium oxide/titanium oxide ratio, A1:43–44  
mantle, B1:3–4  
zirconium/barium ratio vs. barium, A1:43–44  
Indian Ocean mid-ocean ridge basalt mantle isotopic province/Pacific Ocean mid-ocean ridge ocean mantle isotopic province boundary  
evolution, B1:1–40  
geology, A1:3–4  
hafnium isotopes, B1:38  
location, B1:13–14  
mantle, B1:18–19  
mantle flow, B1:3–4  
Indian Ocean mid-ocean ridge basalt sources, depth anomalies, B3:5–10  
intergranular texture  
lithologic units, A11:5  
photograph, A11:16  
photomicrograph, A11:17; A12:18  
intersertal texture  
lithologic units, A3:5–6; A6:5; A14:4  
petrography, A8:3–4  
photomicrograph, A6:16–17, 20  
pillow basalt, A4:3  
iron, pillow basalt, A4:7  
iron<sup>8</sup>, vs. Na<sup>8</sup>, B1:38  
iron ions, enrichment cultures, B6:25–26  
iron oxide  
alteration, B1:7–8  
basalt, A3:10; A6:10–11; A7:11; A9:8–10; A10:5–6; A15:11  
melting regime, B1:14–15  
olivine, B2:5  
pillow basalt, A4:7; A5:7  
vs. magnesium oxide, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42; B2:20  
iron oxide, fractionation-corrected, vs. fractionation-corrected sodium oxide, B1:37  
iron oxide/magnesium oxide ratio, olivine, B2:6  
iron oxyhydroxide  
alteration, A1:10; A3:7–8; A4:3–4; A5:4; A6:5–6; A7:5–8; A8:7–8; A10:4; A11:7–10; A12:8–9; A13:10–11; A15:8–9; B1:7–8  
lithologic units, A3:5–6; A6:4–5; A9:4–5; A11:4–7; A15:3–7  
petrography, A8:3–6  
photograph, A1:35, 40; A4:13; A8:39; A10:13; A11:30; A15:37

- photomicrograph, A1:37, 39; A4:9; A6:31; A7:18, 25–26; A8:29, 35–36; A10:10–11, 15; A11:15, 25; A12:18; A13:25, 35; A14:13; A15:35–36  
 pillow basalt, A4:3; A5:3  
*See also* manganese-iron oxyhydroxide
- iron staining  
 lithologic units, A13:6  
 photomicrograph, A7:24; A9:19; A11:25; A14:13; B5:20
- iron sulfide, scanning electron backscattered electron images, B7:20
- iron-titanium oxide  
 magnetic properties, B1:9–10  
 photomicrograph, A8:28; A12:17; A15:25  
 scanning electron backscattered electron images, B7:20–21
- isochrons, mantle domains, A1:45
- isocon plots, alteration, B1:28; B5:22
- isotopic boundary  
 configuration, A1:21  
 geology, A1:3–4  
 location, B1:4–5  
 maps, A1:19  
 migration, B1:3–4
- isotopic signatures  
 mantle domains, B1:10–14; B2:8–9  
*See also* transitional mid-ocean ridge basalt mantle isotopic signatures
- L**
- lamellar texture, basalt, B7:7
- lanthanum  
 vs. barium, B1:36  
 vs. lanthanum/samarium ratio, B1:36  
 vs. samarium, B1:36
- lanthanum/samarium ratio, vs. lanthanum, B1:36
- lava  
 lead isotopes, B3:8  
 mid-ocean ridge basalt, A1:3–49  
*See also* pillow basalt; pillow lava
- lead isotopes  
 along-axis profiles, A1:20  
 alteration, B1:8  
 basalt, B1:30  
 depth anomalies, B3:6–7  
 lava, B3:8  
 mantle domains, B1:10–12  
 mid-ocean ridge basalt, A1:3–5, 12  
 vs. distance, B3:17, 21  
 vs. hafnium, B3:19  
 vs. hafnium isotopes, B1:33  
 vs. neodymium isotopes, B1:33
- lead-204. *See* lead-206/lead-204 ratio; lead-207/lead-204 ratio; lead-208/lead-204 ratio
- lead-206/lead-204 ratio  
 along-axis profiles, A1:20  
 vs. lead-208/lead-204 ratio, B1:30–31  
 vs. longitude, A1:41  
 vs. zirconium/barium ratio, A1:41
- lead-207/lead-204 ratio, along-axis profiles, A1:20
- lead-208/lead-204 ratio  
 along-axis profiles, A1:20  
 vs. lead-206/lead-204 ratio, B1:30–31
- limestone, micritic  
 lithologic units, A7:3–5  
 photograph, A1:24; A6:14
- lithologic units  
 Site 1152, A3:4–7, 28  
 Site 1155, A6:3–5  
 Site 1156, A7:3–5  
 Site 1157, A8:3–7  
 Site 1158, A9:5  
 Site 1160, A11:3–7  
 Site 1161, A12:3–9  
 Site 1162, A13:3–7  
 Site 1163, A14:2–4  
 Site 1164, A15:2–7  
 Unit 1, A3:4–6; A6:3–5; A7:3–5; A11:3–4; A12:3–8; A13:3–4, 6; A14:3; A15:3–7  
 Unit 2, A3:6–7; A6:4; A7:4–5; A11:4–5; A13:4–7; A14:3–4  
 Unit 3, A11:5  
 Unit 4, A11:5–6  
 Unit 5, A11:6  
 Unit 6, A11:6–7  
 Unit 7, A11:7
- lithology, summary, B5:24
- loss on ignition  
 alteration, B5:10  
 vs. distance, B5:23
- lutetium/hafnium ratio, geochemical signals, B1:18–19
- M**
- maghemitization, basalt, B7:7–9
- magmas  
 magnesium number, B2:7  
 nickel oxide, B2:7  
 olivine, B2:5–7
- magnesium, alteration, B5:9
- magnesium number  
 clinopyroxene, B2:4  
 magmas, B2:7–9  
 olivine, B2:3, 6–7  
 vs. nickel oxide, B2:17–18, 21
- magnesium oxide  
 alteration, B1:7–8; B5:10–11  
 basalt, A1:8–9, 13; A3:9–11; A6:10–11; A7:10–12; A8:11–12; A9:8–10; A10:5–6; A11:12–13; A12:11; A13:14; A14:7–8; A15:11–12  
 mantle domains, A3:11; A7:12; A12:11; A13:14  
 melting regime, B1:15  
 olivine, B2:5  
 pillow basalt, A1:42; A4:6–7; A5:7  
 vs. distance, B5:23  
 vs. major elements, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42; B1:35; B2:20  
 vs. sodium oxide/titanium oxide ratio, A1:4–5, 13, 43–44; A3:26; A4:19; A5:19; A6:38; A7:35; A8:53; A9:23; A10:26; A11:37; A12:43; A13:43; A14:30; A15:44

- vs. trace elements, A3:25; A4:18; A5:18; A6:37; A7:34; A8:52; A9:22; A10:25; A11:36; A12:42; A13:42; A14:29; A15:43
- See also* iron oxide/magnesium oxide ratio
- magnetic anomalies, basalt, B7:6
- magnetic lineations, maps, A1:19
- magnetic properties, basalt, B1:9–10; B7:1–25
- magnetic susceptibility, low-field, vs. natural remanent magnetization, B7:16
- magnetic susceptibility, mid-ocean ridge basalt, B7:5–9
- magnetite
  - alteration, A1:11; A12:9
  - photomicrograph, A12:40
- magnetite, stoichiometric, mid-ocean ridge basalt, B7:4–9
- major elements
  - alteration, B1:7–8; B5:8–11
  - alteration isocon plots, B1:28
  - basalt, A3:9–11, 31; A4:6–7, 22; A5:6–7, 22; A6:9–12, 41–42; A7:10–12, 38–39; A8:11–12, 56; A9:8–10, 26; A10:5–6, 29; A11:12–13, 41–42; A12:10–11, 47; A13:14, 46; A14:7–8, 33; A15:11–12, 48
  - correlation coefficients of alteration, B5:27–29
  - melting regime, B1:14–15
  - vs. magnesium oxide, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42; B1:35
- manganese–iron oxyhydroxide, photomicrograph, A8:36
- manganese oxide
  - alteration, A1:11; A3:7–8; A4:3–4; A6:5–6; A7:5–8; A9:5–7; A11:7–10; A12:8–9; A13:10; A14:4–5; A15:7–9; B1:7–8; B5:10
  - lithologic units, A6:4–5; A13:6
  - photograph, A1:40; A6:25; A8:39; A10:12–13; A11:22; A12:22; A13:34
  - photomicrograph, A1:39; A6:27–28; A8:20, 36, 40; A10:14; A12:24, 33; A15:26, 37; B1:27
- manganese oxide, dendritic, photograph, A3:19
- mantle
  - Australian Antarctic Mantle Anomaly, B1:2–3
  - flow, A1:3–4
  - heterogeneity, B3:1–24
  - plate tectonics, B1:19–21
  - subduction, B3:10
- mantle domains
  - barium/zirconium ratio, A4:7; A5:7
  - composition, A1:13–15; A3:10–11
  - distribution, A1:14–15
  - isotopic signatures, B1:10–14
  - magnesium oxide, A12:11; A13:14
  - sodium oxide/titanium oxide ratio, A7:12; A8:12; A10:6; A11:13
  - zirconium/barium ratio, A6:11; A9:9–10; A14:8; A15:12
  - Zone A, A9:10
- mantle flow, Indian/Pacific mantle isotopic boundary, B1:3–4
- mantle sources, mid-ocean ridge basalt, B2:1–26
- Marinobacter* cluster, microbial populations, B6:9
- massive basalt. *See* basalt, massive
- matrix. *See* clast/matrix ratio
- megacrysts, photograph, A13:24
- melt inclusions
  - lithologic units, A7:5; A11:6–7; A13:3–4
  - photomicrograph, A11:18; A12:16; A13:17
- melting regime
  - residual arc, B1:20–21
  - variations, B1:14–15
- melts, olivine, B2:5–7, 23
- mesostasis
  - alteration, A1:10; A13:10–11
  - lithologic units, A11:4; A13:4; A14:3
  - petrography, A8:4
  - photomicrograph, A1:32; A3:15–16, 18; A10:14; A13:31; A14:13–14; A15:36
- metabasalt
  - lithologic units, A13:3–4
  - photomicrograph, A13:16, 19, 31
- metabolic products, enrichment cultures, B6:6, 25–26
- metadiabase
  - alteration, A13:8
  - lithologic units, A13:4
  - petrography, A13:5
  - photograph, A13:28
  - photomicrograph, A13:20, 29
- metagabbro
  - alteration, A13:8
  - lithologic units, A13:4
  - petrography, A13:5
  - photomicrograph, A13:21
- metamorphic facies, alteration, A13:9–10
- metamorphism, alteration, A1:11
- methane, enrichment cultures, B6:6, 25–26
- micrite
  - lithologic units, A7:4–5
  - photograph, A1:26
- microbial degradation, photomicrograph, A1:39
- microbial populations
  - alteration, B1:7
  - basalt, B6:1–27
  - detection, B1:5–6; B1:27
  - growth, B6:23–24
  - phylogeny, B6:6–8, 14–19
- microbiology
  - rocks, A3:30
  - Site 1152, A3:8
  - Site 1153, A4:4–5
  - Site 1154, A5:4–5
  - Site 1155, A6:7
  - Site 1156, A7:8
  - Site 1157, A8:8–9
  - Site 1158, A9:7
  - Site 1159, A10:4
  - Site 1160, A11:10
  - Site 1161, A12:9–10
  - Site 1162, A13:11
  - Site 1163, A14:5–6
  - Site 1164, A15:9–10
- microcracks, photomicrograph, A11:25; A12:23
- microcrystalline texture, petrography, A15:5
- microfossils
  - composition, A13:13
  - sediments, A10:5



microlites  
  lithologic units, A13:3–4; A14:4; A15:3  
  petrography, A15:5–6  
  photomicrograph, A6:20  
  pillow basalt, A4:3  
microphenocrysts  
  basalt, A1:8–9  
  photomicrograph, A6:21  
microspheres  
  basalt, B1:6  
  detection, A3:30; A13:11; A14:5–6; A15:9  
mid-ocean ridge basalt  
  isotopic boundary, A1:1–49  
  magnetic properties, B7:1–25  
  mineral composition, B2:1–26  
mineral composition, mid-ocean ridge basalt, B2:1–26  
minor elements, basaltic glass, B5:8  
mixing, Indian and Pacific Ocean sources, B3:7–8

## N

neodymium  
  alteration, B1:8  
  vs. distance, B3:17–18, 21  
  vs. strontium isotopes, B3:19, 22  
neodymium isotopes  
  along-axis profiles, A1:20  
  alteration, B1:8  
  mantle domains, B1:12  
  mantle heterogeneity, B3:1–24  
  mid-ocean ridge basalt, A1:3–5  
  vs. hafnium isotopes, B1:34  
  vs. lead isotopes, B1:33  
  vs. strontium isotopes, B1:29  
neodymium-143/neodymium-144 ratio  
  along-axis profiles, A1:20  
  vs. samarium-147/samarium-144 ratio, B3:20  
nickel  
  alteration, B5:9  
  basalt, A3:10; A6:10–11; A7:11; A8:11; A9:8; A10:5;  
    A15:11  
  vs. magnesium oxide, A3:25; A4:18; A5:18; A6:37;  
    A7:34; A8:52; A9:22; A10:25; A11:36; A12:42;  
    A13:42; A14:29; A15:43  
nickel oxide  
  magmas, B2:7–9  
  olivine, B2:3, 6–7  
  vs. magnesium number, B2:17–18, 21  
niobium, geochemical signals, B1:18

## O

olivine  
  actual composition vs. calculated composition, B2:6–  
    7, 22, 26  
  alteration, A1:10; A8:7–8; A9:6–7; A13:8–11; A14:5  
  composition, B1:14  
  equilibrated composition with melt and primary  
    magma composition, B2:5–7, 24–25  
  lithologic units, A6:3–5; A7:4  
  mid-ocean ridge basalt, B2:3

  photograph, A15:21  
  photomicrograph, A5:13; A7:16; A8:26; A10:9;  
    A11:15, 19; A13:19; A14:16; A15:32; B5:18  
olivine, “Chinese lantern,” pillow basalt, A4:3  
olivine, skeletal  
  petrography, A8:5–6  
  photomicrograph, A8:34; A15:23  
olivine microlites, lithologic units, A13:3–4  
olivine microphenocrysts  
  lithologic units, A3:5–6; A9:3–5; A15:3–7  
  petrography, A8:4  
  photograph, A12:15; A15:35  
  photomicrograph, A12:18; A13:26; A14:12  
  pillow basalt, A4:3  
olivine microphenocrysts, skeletal, photomicrograph,  
  A5:11; A8:16  
olivine phenocrysts  
  alteration, A7:5–8; A11:8–10; A15:8–9; B1:7–8; B5:7  
  basalt, A1:8–9  
  lithologic units, A3:6–7; A6:4–5; A9:3–5; A10:2–3;  
    A11:4–7; A14:3; A15:3–7  
  petrography, A8:3–7; A12:3–8; A13:5–7  
  photomicrograph, A8:46; A13:20, 25, 30; A15:14, 34  
  pillow basalt, A5:2–3  
olivine phenocrysts, iddingsitized  
  photograph, A8:39  
  photomicrograph, A3:21; A7:19  
olivine phenocrysts, skeletal, photomicrograph, A1:29;  
  A8:25  
on-axis samples, isotopes, B3:8–9  
ooze, calcareous  
  Sedimentary Unit B, A4:5  
  sediments, A5:6  
oscillatory zoning  
  petrography, A13:5  
  photomicrograph, A9:16; A13:19  
overgrowths  
  photomicrograph, A13:18  
  pillow basalt, A5:3  
oxidation  
  alteration, A8:8; A11:7–10; A14:5  
  basalt, A10:3–4; B7:7  
  petrography, A12:6–7  
  remanent magnetization, B7:8  
oxidation rims, alteration, A10:3–4

## P

Pacific Ocean mid-ocean ridge basalt mantle isotopic  
  province domain distribution, A1:14–16  
  magnesium oxide vs. sodium oxide/titanium oxide  
    ratio, A1:43–44  
  mantle, B1:3–4  
  zirconium/barium ratio vs. barium, A1:43–44  
  *See also* Indian Ocean mid-ocean ridge basalt mantle  
    isotopic province/Pacific Ocean mid-ocean  
    ridge basalt mantle isotopic province boundary  
Pacific Ocean sources, depth anomalies, B3:5–10  
palagonite  
  alteration, A1:10–11; A4:4; A6:5–7; A7:5–8; A9:5–7;  
    A13:11; B1:7–8

- lithologic units, A6:4–5; A11:4; A13:6; A14:3–4  
 petrography, A8:5; A15:6–7  
 photograph, A1:38; A4:14; A7:21–22, 28; A8:32;  
     A10:7, 16, 18; A11:27; A12:21, 31; A14:9–10, 17,  
     24; A15:18, 21, 28, 37  
 photomicrograph, A1:39; A6:29, 31; A8:44; A12:28;  
     A13:22; A15:31, 39; B5:19  
*See also* clasts
- palagonitization  
   alteration, A4:4; A15:9  
   composition, A11:12  
   photograph, A7:22  
   photomicrograph, A6:29; B5:16  
 partial melting, basalt, B2:23  
 petrography, basalt, A1:8–9; B2:13–15  
 phenocrysts  
   alteration, A1:9–10; B5:7  
   lithologic units, A7:5  
 phosphorus oxide, alteration, B5:10  
 phylogeny, microbial populations, B6:6–8, 14–19  
 pillow basalt  
   alteration, A4:3–4; A5:3–4; A14:5  
   lithologic units, A9:3–5  
   magnetic properties, B1:9–10; B7:4–9  
   petrology, A1:7  
   photograph, A1:22  
   photomicrograph, A5:12  
   scanning electron backscattered electron images,  
     B7:20  
 pillow basalt, aphyric  
   lithologic units, A11:3–4  
   lithology, A4:3  
 pillow basalt, plagioclase–olivine phyrlic  
   lithology, A5:2–3  
   photograph, A1:28; A5:8  
 pillow lava  
   microbiology, A3:8  
   photograph, A14:9  
 pillow margin  
   alteration, A15:7–8  
   photograph, A4:15; A6:15, 24–25; A10:16; A15:37  
 pillow margin, spherulitic, photograph, A1:35; A4:13  
 pillow rinds, palagonitized, alteration, A1:10–11  
 pillow rinds, photograph, A1:38; A3:19; A4:14–15  
 plagioclase  
   alteration, A13:10–11  
   lithologic units, A6:3–5; A7:4  
   mid-ocean ridge basalt, B2:4  
   photograph, A10:8; A13:28  
   photomicrograph, A3:13, 21; A4:9–10; A6:32; A7:16,  
     25; A8:16, 25, 30, 45; A9:12–14, 19; A11:14, 19;  
     A12:19, 23–24; A13:17–18, 29, 35; A14:13, 16;  
     A15:16, 19, 23, 25; B5:20  
   scanning electron backscattered electron images,  
     B7:20  
   sediments, A4:5; A5:6  
   *See also* albite; albite twinning; anorthite; oscillatory  
     zoning  
 plagioclase, acicular  
   petrography, A8:3–4  
   photomicrograph, A6:22; A8:27  
   plagioclase, euhedral, photograph, A1:31  
   plagioclase, partially resorbed, photomicrograph, A5:10  
   plagioclase, prismatic, photomicrograph, A1:29; A3:16;  
     A5:13; A8:25; A11:17  
   plagioclase, sieve-textured, photomicrograph, A1:30;  
     A7:15  
   plagioclase, skeletal  
     basalt, A1:9  
     photomicrograph, A14:13  
   plagioclase, tabular, photomicrograph, A15:15, 24  
   plagioclase laths, photomicrograph, A14:14  
   plagioclase megacrysts, photograph, A13:24  
   plagioclase microlites, lithologic units, A14:4  
   plagioclase microphenocrysts, photomicrograph, A9:16;  
     A14:12  
   plagioclase microphenocrysts, partially resorbed, photo-  
     micrograph, A3:17  
   plagioclase phenocrysts  
     alteration, A7:5–8; A8:8; A11:8–10; A15:8–9; B1:7–8;  
       B5:7  
     basalt, A1:8–9  
     composition, B2:19  
     lithologic units, A3:5–6; A6:4–5; A9:3–5; A11:3–7;  
       A14:3; A15:3–7  
     petrography, A8:3–7; A12:3–8; A13:5–7  
     photomicrograph, A5:9–10; A6:17–21; A7:14, 18, 24;  
       A8:35; A9:14; A11:18, 25; A15:35  
   pillow basalt, A5:2–3  
   plagioclase phenocrysts, prismatic  
     lithologic units, A10:2–3; A11:3–4  
     petrography, A8:5–6  
   plagioclase phenocrysts, tabular, photograph, A15:13  
   plagioclase xenocrysts, lithologic units, A13:3–4  
 plate tectonics  
   mantle, B1:19–21  
   Southeast Indian Ridge, B1:1–40  
 plumose quench texture  
   lithologic units, A3:5–6; A14:4; A15:3  
   petrography, A8:4; A12:4  
   photograph, A12:20  
   photomicrograph, A1:32; A3:15, 18; A14:14; A15:14–15  
 potassium  
   alteration, B1:8; B5:9  
   vs. chloride, B4:7  
   *See also* chloride/potassium ratio  
 potassium oxide  
   alteration, B1:7–8  
   basalt, A10:5; A15:11  
   melting regime, B1:14–15  
   pillow basalt, A4:6; A5:7  
 precipitation, calcite, A8:8  
*Pseudoalteromonas flavipulchra*, microbial populations,  
   B6:7, 9  
*Pseudomonas stutzeri*, microbial populations, B6:9–10  
 pseudomorphs  
   basalt, B7:7  
   lithologic units, A12:7–8; A13:4  
   photomicrograph, A8:34; A12:27; A13:16  
   scanning electron backscattered electron images,  
     B7:20  
 pseudosingle domain, basalt, B7:7

pyrite

- alteration, A12:9
- photomicrograph, A12:40

**Q**

quartz

- alteration, A11:7–10; A12:8–9; A14:4–5
- lithologic units, A13:4
- petrography, A15:7
- photograph, A10:17
- photomicrograph, A13:31
- sediments, A4:5; A5:6

quench crystals

- lithologic units, A10:3
- petrography, A8:3–4
- photograph, A10:8; A15:30
- photomicrograph, A8:21; A10:9, 14; A13:18; A15:17

quench crystals, spherulitic, lithologic units, A15:4–7

quench texture

- alteration, A7:5–8; A10:4; A11:8–10
- petrography, A12:4–5
- photograph, A11:27; A13:33
- photomicrograph, A8:27, 30; A15:23
- pillow basalt, A5:3

quench zone

- alteration, A13:8
- photomicrograph, A5:12; A6:22

**R**

recrystallization

- petrography, A8:7
- photograph, A6:27

remanent magnetization, characteristic, mid-ocean ridge basalt, B7:9

remanent magnetization, natural

- mid-ocean ridge basalt, B7:4–9
- vs. age, B7:14
- vs. Curie temperature, B7:15
- vs. low-field magnetic susceptibility, B7:16

remanent magnetization, saturation, hysteresis ratios, B7:19

residual arc, mantle, B1:16–17

resorption, photomicrograph, A6:17; A15:19

rift tip tectonic environment, basalt, A12:11

rocks, enrichment cultures, A3:30; A4:21; A5:21; A6:40; A7:37; A8:55; A9:25; A10:28; A11:40; A12:46; A13:45; A14:32; A15:47

rubble, alteration, A9:5–7

rubble, basaltic

- alteration, A12:9
- lithologic units, A8:3–7; A12:3–8; A15:4–7
- petrography, A15:4–6
- petrology, A1:7
- photograph, A12:38; A15:20

rubidium, alteration, B1:8; B5:9

**S**

samarium

- vs. lanthanum, B1:36
- See also lanthanum/samarium ratio

samarium/neodymium ratio

- depth anomalies, B3:7
- volcanic glass, B3:5

samarium-147/neodymium-144 ratio, vs. distance, B3:18

samarium-147/samarium-144 ratio, vs. neodymium-143/neodymium-144 ratio, B3:20

sand

- photograph, A15:30
- sediments, A4:5

secondary minerals, photomicrograph, A12:40; A13:20

Sedimentary Unit A, clay, A4:5

Sedimentary Unit B, calcareous ooze, A4:5

sediments

- lithologic units, A14:4
- lithology, A5:6
- petrography, A8:6–7
- photograph, A14:11
- Site 1153, A4:5–6
- Site 1154, A5:6
- Site 1155, A6:8–9
- Site 1156, A7:9–10
- Site 1157, A8:9–10
- Site 1158, A9:8
- Site 1159, A10:5
- Site 1160, A11:11–12
- Site 1161, A12:10
- Site 1162, A13:13
- Site 1163, A14:6–7
- Site 1164, A15:10
- zoning, A6:35

sediments, calcareous

- alteration, A14:4–5
- color, A8:50
- lithologic units, A7:3–5
- photograph, A7:13

sediments, interpillow, petrology, A1:7–8

sediments, lithic-rich calcareous, photograph, A8:19

sediments, pelagic, photograph, A3:19

sediments, siliceous, color, A8:50

seismic profiles

- Site 1152, A3:23
- Site 1153, A4:16
- Site 1154, A5:16
- Site 1155, A6:34
- Site 1156, A7:31
- Site 1157, A8:49
- Site 1158, A9:20
- Site 1159, A10:20–23
- Site 1160, A11:34
- Site 1162, A13:40
- Site 1163, A14:27
- Site 1164, A15:41

seismic reflection, profiles, A3:9; A5:5; A6:8; A8:9–10; A10:4–5; A11:11

- seismic surveys, track chart, A3:22; A5:15; A6:33; A7:32;  
A8:48; A10:19; A11:33; A13:39; A14:26; A15:40
- selvage, alteration, A12:8–9
- selvage, silica, photograph, A1:40; A8:39
- sericite, photomicrograph, A12:19
- sheaf quench texture  
lithologic units, A3:5–6; A7:5; A10:3  
petrography, A8:3–7  
photograph, A12:20  
photomicrograph, A3:13; A4:10; A8:16; A14:13  
pillow basalt, A4:3
- shear relay zones, alteration, A13:9
- shear zones  
alteration, A13:8–9  
photograph, A13:32, 38  
ultracataclastite, A13:12
- Shewanella*, microbial populations, B6:8
- shrinkage cracks, scanning electron backscattered electron images, B7:21
- sieve texture  
lithologic units, A7:5; A14:3  
petrography, A8:3–4; A12:3–4; A15:5  
photomicrograph, A6:17–18; A7:15; A15:19
- silica  
alteration, A5:4; A10:3–4; B1:7–8; B5:10–11  
melting regime, B1:14–15  
photograph, A5:14; A10:12–13; A12:39  
photomicrograph, A1:39; A6:31; A12:33  
vs. distance, B5:23  
vs. magnesium oxide, B1:35; B2:20
- silica, cryptocrystalline  
alteration, A4:4; A8:7–8; A9:5–7; A11:7–10; A12:8–9;  
A14:4–5; A15:8–9  
lithologic units, A13:7  
photograph, A1:34, 37  
photomicrograph, A12:23–24
- siliceous microfossils, clay, A7:10
- silt  
photograph, A15:30  
photomicrograph, A15:32
- silt, clayey, petrography, A12:6
- Site 1152, A3:1–31  
alteration, A3:7–8; B5:5  
coring summary, A3:27  
geochemistry, A3:9–11  
igneous petrology, A3:4–7  
lithologic units, A3:4–7, 28  
microbiology, A3:8  
operations, A3:2–4  
principal results, A3:1–2  
site description, A3:1–31  
site geophysics, A3:8–9
- Site 1153, A4:1–22  
alteration, A4:3–4; B5:5  
alteration isocon plots, B1:27  
coring summary, A4:20  
geochemistry, A4:6–7  
hafnium isotopes, B1:13  
igneous petrology, A4:3  
isocon plots, B5:22  
mantle domains, B1:11  
microbiology, A4:4–5  
operations, A4:2  
principal results, A4:1–2  
sediments, A4:5–6  
site description, A4:1–22  
site geophysics, A4:5
- Site 1154, A5:1–22  
alteration, A5:3–4; B5:5  
coring summary, A5:20  
geochemistry, A5:6–7  
igneous petrology, A5:2–3  
microbiology, A5:4–5  
operations, A5:2  
principal results, A5:1–2  
sediments, A5:6  
site description, A5:1–22  
site geophysics, A5:5
- Site 1155, A6:1–42  
alteration, A6:5–7; B5:5  
coring summary, A6:39  
geochemistry, A6:9–12  
igneous petrology, A6:3–5  
lithologic units, A6:3–5  
microbiology, A6:7  
operations, A6:2–3  
principal results, A6:1–2  
sediments, A6:8–9  
site description, A6:1–42  
site geophysics, A6:8  
strontium isotopes vs. neodymium isotopes, B1:29  
structural geology, A6:7–8
- Site 1156, A7:1–39  
alteration, A7:5–8; B5:6  
coring summary, A7:36  
geochemistry, A7:10–12  
igneous petrology, A7:3–5  
lithologic units, A7:3–5  
microbiology, A7:8  
operations, A7:2–3  
principal results, A7:1–2  
sediments, A7:9–10  
site description, A7:1–39  
site geophysics, A7:9  
structural geology, A7:8–9
- Site 1157, A8:1–56  
alteration, A8:7–8; B5:6  
coring summary, A8:54  
geochemistry, A8:10–12  
igneous petrology, A8:2–7  
lithologic units, A8:3–7  
mantle domains, B1:11  
microbiology, A8:8–9  
operations, A8:2  
principal results, A8:1–2  
sediments, A8:9–10  
site description, A8:1–56  
structural geology, A8:9
- Site 1158, A9:1–26  
alteration, A9:5–7; B5:6  
coring summary, A9:24  
geochemistry, A9:8–10

- hafnium isotopes, B1:13
- igneous petrology, A9:3–5
- lithologic units, A9:5
- mantle domains, B1:11
- microbiology, A9:7
- operations, A9:2–3
- principal results, A9:1–2
- sediments, A9:8
- site description, A9:1–26
- site geophysics, A9:7
- Site 1159, A10:1–29
  - alteration, A10:3–4; B5:6
  - coring summary, A10:27
  - geochemistry, A10:5–6
  - igneous petrology, A10:2–3
  - microbiology, A10:4
  - operations, A10:2
  - principal results, A10:1
  - sediments, A10:5
  - site description, A10:1–29
  - site geophysics, A10:4–5
- Site 1160, A11:1–42
  - alteration, A11:7–10; B5:6
  - coring summary, A11:38
  - geochemistry, A11:12–13
  - igneous petrology, A11:3–7
  - lithologic units, A11:3–7
  - lithologic units summary, A11:39
  - microbiology, A11:10
  - operations, A11:2–3
  - principal results, A11:1–2
  - sediments, A11:11–12
  - site description, A11:1–42
  - site geophysics, A11:11
  - strontium isotopes vs. neodymium isotopes, B1:29
  - structural geology, A11:10–11
- Site 1161, A12:1–47
  - alteration, A12:8–9; B5:6–7
  - coring summary, A12:44
  - geochemistry, A12:10–11
  - igneous petrology, A12:3–8
  - lithologic units, A12:3–9
  - microbiology, A12:9–10
  - operations, A12:2
  - principal results, A12:1–2
  - sediments, A12:10
  - site description, A12:1–47
  - site geophysics, A12:10
- Site 1162, A13:1–46
  - alteration, A13:7–11; B5:7
  - coring summary, A13:44
  - geochemistry, A13:14
  - igneous petrology, A13:3–7
  - lithologic units, A13:3–7
  - microbiology, A13:11
  - operations, A13:2–3
  - sediments, A13:13
  - site description, A13:1–46
  - site geophysics, A13:12
  - structural geology, A13:12
- Site 1163, A14:1–33
  - alteration, A14:4–5; B5:7
  - alteration isocon plots, B1:27
  - coring summary, A14:31
  - geochemistry, A14:7–8
  - igneous petrology, A14:2–4
  - isocon plots, B5:22
  - lithologic units, A14:2–4
  - microbiology, A14:5–6
  - operations, A14:2
  - principal results, A14:1–2
  - sediments, A14:6–7
  - site description, A14:1–33
  - site geophysics, A14:6
  - structural geology, A14:6
- Site 1164, A15:1–48
  - alteration, A15:7–9; B5:7
  - coring summary, A15:45
  - geochemistry, A15:11–12
  - igneous petrology, A15:2–7
  - lithologic units, A15:2–7
  - microbiology, A15:9–10
  - operations, A15:2
  - principal results, A15:1–2
  - sediments, A15:10
  - site description, A15:1–48
  - site geophysics, A15:10
- site geophysics
  - Site 1152, A3:8–9
  - Site 1153, A4:5
  - Site 1154, A5:5
  - Site 1155, A6:8
  - Site 1156, A7:9
  - Site 1158, A9:7
  - Site 1159, A10:4–5
  - Site 1160, A11:11
  - Site 1161, A12:10
  - Site 1162, A13:12
  - Site 1163, A14:6
  - Site 1164, A15:10
- slickensides, lithologic units, A13:7
- smectite
  - alteration, A3:7–8; A5:4; A6:5–6; A7:5–8; A9:5–7; A11:10; B1:7–8
  - lithologic units, A3:5–6
  - photograph, A1:40; A8:39
  - photomicrograph, A1:32, 37, 39; A3:15; A5:12; A6:16, 23; A7:18, 25–26; A8:35; A9:18; A11:21, 25, 32; A13:35; B5:16, 17
  - pillow basalt, A4:3
- snowball texture, photomicrograph, A9:15
- sodium
  - alteration, B5:9
  - mantle domains, A1:13–14
  - pillow basalt, A4:7
- sodium8, vs. Fe8, B1:38
- sodium oxide
  - basalt, A6:10–11; A10:5–6; A11:12–13; A13:14; A15:11
  - melting regime, B1:14–15
  - olivine, B2:5
  - pillow basalt, A5:7
  - vs. magnesium oxide, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42; B2:20

- sodium oxide, fractionation-corrected, vs. fractionation-corrected iron oxide, B1:37
- sodium oxide/titanium oxide ratio  
 basalt, A3:11; A12:11; A13:14  
 isotopic boundary, B1:5  
 mantle domains, A3:11; A4:7; A5:7; A6:11; A7:12; A8:12; A10:6; A11:13; A15:12  
 mid-ocean ridge basalt, A1:4–5, 12–13  
 vs. magnesium oxide, A1:4–5, 43–44; A3:26; A4:19; A5:19; A6:38; A7:35; A8:53; A9:23; A10:26; A11:37; A12:43; A13:43; A14:30; A15:44
- Southeast Indian Ridge  
 Australian Antarctic Discordance, B1:1–40  
 maps, A1:19; B1:25; B2:16
- spherulites  
 alteration, A1:9–10; A7:7–8; A13:8  
 lithologic units, A3:5–6; A10:3; A13:3–7; A14:3–4  
 petrology, A1:7  
 photograph, A1:34; A8:17; A10:8, 17; A12:20, 29; A14:9; A15:18  
 photomicrograph, A4:9; A5:12; A6:22; A12:35; A13:16, 31  
 pillow basalt, A4:3
- spherulitic texture  
 alteration, A9:5–7  
 lithologic units, A9:3–5; A12:7–8  
 photograph, A12:34, 37  
 photomicrograph, A12:30; A13:31
- spherulitic zone, alteration, A10:3
- spinel  
 mid-ocean ridge basalt, B2:4  
*See also* chrome spinel
- spinel microphenocrysts  
 petrography, A12:4  
 photomicrograph, A12:16
- strontium  
 alteration, B1:8  
 basalt, A3:10; A6:10–11; A7:11; A8:11; A11:13; A12:11  
 pillow basalt, A5:7  
 vs. magnesium oxide, A3:25; A4:18; A5:18; A6:37; A7:34; A8:52; A9:22; A10:25; A11:36; A12:42; A13:42; A14:29; A15:43  
 Zone A, A8:12
- strontium isotopes  
 along-axis profiles, A1:20  
 alteration, B1:8  
 mantle domains, B1:12  
 mantle heterogeneity, B3:1–24  
 mid-ocean ridge basalt, A1:3–5  
 vs. distance, B3:17, 21  
 vs. neodymium, B3:19, 22  
 vs. neodymium isotopes, B1:29
- strontium-87/strontium-86 ratio, along-axis profiles, A1:20
- structural geology  
 Site 1155, A6:7–8  
 Site 1156, A7:8–9  
 Site 1157, A8:9
- Site 1160, A11:10–11  
 Site 1162, A13:12  
 Site 1163, A14:6
- subduction, mantle, B3:10
- subophitic texture  
 lithologic units, A3:5–6; A9:5; A11:4–7; A15:3–7  
 photomicrograph, A1:33; A9:17; A11:14; A12:18; A15:16
- sulfur, submarine basaltic volcanic glass, B4:3
- T**
- talc  
 alteration, A1:11; A13:8  
 high-temperature alteration, B5:8  
 photomicrograph, A13:20, 25, 30
- texture. *See* box texture; dendritic texture; honeycomb texture; intergranular texture; intersertal texture; lamellar texture; microcrystalline texture; plumose quench texture; quench texture; sheaf quench texture; sieve texture; snowball texture; spherulitic texture; subophitic texture; vermiform texture; vesicular texture
- Thalassolituus oleivorans*, microbial populations, B6:9
- thermomagnetic curves, basalt, B7:7–8, 13
- thermoremanent magnetization, mid-ocean ridge basalt, B7:9
- titanium  
 mantle domains, A1:13–14  
 pillow basalt, A4:7
- titanium oxide  
 alteration, B5:10  
 basalt, A3:10; A8:11–12; A9:8–9; A10:6; A11:12–13; A14:8; A15:11  
 melting regime, B1:14–15  
 vs. magnesium oxide, A3:24; A4:17; A5:17; A6:36; A7:33; A8:51; A9:21; A10:24; A11:35; A12:41; A13:41; A14:28; A15:42  
*See also* iron–titanium oxide; sodium oxide/titanium oxide ratio
- titanomaghemite, basalt, B7:7–9
- titanomagnetite  
 basalt, B7:6–7  
 magnetic properties, B1:9–10  
 scanning electron backscattered electron images, B7:20  
*See also* iron–titanium oxide
- titanomagnetite pseudomorphs, scanning electron backscattered electron images, B7:20–21
- trace elements  
 alteration, B1:7–8; B5:8–11  
 alteration isocon plots, B1:28  
 basalt, A3:9–11, 31; A4:6–7, 22; A5:6–7, 22; A6:9–12, 41–42; A7:10–12, 38–39; A8:11–12, 56; A9:8–10, 26; A10:5–6, 29; A11:12–13, 41–42; A12:10–11, 47; A13:7–8, 14, 46; A14:7–8, 33; A15:11–12, 48; B1:36  
 correlation coefficients of alteration, B5:27–29  
 melting regime, B1:14–15

vs. magnesium oxide, A3:25; A4:18; A5:18; A6:37;  
A7:34; A8:52; A9:22; A10:25; A11:36; A12:42;  
A13:42; A14:29; A15:43  
transitional mid-ocean ridge basalt mantle isotopic sig-  
natures, Australian Antarctic Discordance, B1:3–4  
Transitional Pacific-type glass, domain distribution,  
A1:14  
Transitional Pacific-type mantle, domain distribution,  
A1:14–16  
Type 1 basalt, petrography, A12:7  
Type 2 basalt, petrography, A12:7  
Type 3 basalt, petrography, A12:7  
Type 4 basalt, petrography, A12:7

## U

ultracataclasite, shear zones, A13:12  
ultracataclasite, basaltic, photograph, A13:38

## V

veins  
alteration, A1:11; A7:5–8; A10:3–4; A13:9–11; A14:4–  
5; A15:9; B1:7–8; B5:7, 11  
basalt, A6:7–8; A7:9; A11:10  
density, A12:9  
petrography, A8:6–7  
photograph, A14:24  
photomicrograph, A10:10–11  
structure, A13:12; A14:5–6  
*See also* fracture + vein density  
veins, calcite  
alteration, A1:11; A6:6–7; A8:8  
photograph, A1:40; A4:14–15; A6:24–26; A7:23;  
A8:39; A11:22, 24, 29–30; A14:20–21  
photomicrograph, A1:39; A6:21, 28, 31–32; A11:29;  
A14:22; B5:19  
veins, chlorite, alteration, A11:9–10  
veins, dolomite  
alteration, A1:11  
photograph, A13:34  
photomicrograph, A13:37  
veins, lithic, alteration, A8:8  
veins, micritic calcite, photomicrograph, A8:34–36, 40–  
42, 44–45  
veins, palagonite  
alteration, A11:9–10  
photograph, A11:27  
veins, quartz, photomicrograph, A13:17, 31  
veins, silica  
photograph, A1:38; A11:23  
photomicrograph, A10:10, 16; B5:19  
veins, sparry calcite  
alteration, A11:8–10  
photograph, A6:15  
photomicrograph, A8:35–36, 40, 43  
veins, zeolite, photomicrograph, B1:27  
vermiform texture, photomicrograph, A8:23  
vesicles  
alteration, A6:5–6; A9:6–7; A15:8–9; B1:7–8; B5:7

lithologic units, A3:4–6; A6:3–5; A7:5; A9:5; A11:4;  
A14:4; A15:4–7  
petrography, A8:4; A15:5–6  
photomicrograph, A6:16, 23; A10:14–15; A11:21, 32;  
A15:17; B5:17  
pillow basalt, A4:3  
vesicular texture, photomicrograph, A9:12  
volatiles, submarine basaltic volcanic glass, B4:1–8  
volcanic glass  
alteration, A1:10–11; A6:25; A7:5–8; B1:8–9  
biodegradation, A6:30  
geochemistry, A4:22; A5:22; A6:41–42; A7:38–39;  
A8:56; A9:26; A10:29; A11:41–42; A12:47;  
A13:46; A14:33; A15:48  
lead-206/lead-204 ratio vs. lead-208/lead-204 ratio,  
B1:31  
lithologic units, A11:4  
occurrence, A3:29  
petrography, A8:5–6; A15:6–7  
photograph, A1:38; A8:32; A10:7, 16, 18; A11:27;  
A12:20; A14:9; A15:28  
photomicrograph, A5:12; A12:28; A15:31, 38–39;  
B5:16, 19  
samarium/neodymium ratio, B3:5  
*See also* glass rinds; glass shards  
volcanic glass, basaltic  
photograph, A12:39  
photomicrograph, A6:30  
volcanic glass, devitrified  
lithologic units, A3:5–6  
photomicrograph, A7:25  
volcanic glass, palagonitized  
lithologic units, A7:3–5  
photograph, A1:26; A6:29; A7:13  
volcanic glass, quenched, photomicrograph, A15:17  
volcanic glass, spherulitic, photomicrograph, A6:22  
volcanic glass, submarine basaltic, volatiles, B4:1–8  
vugs  
petrography, A8:7  
photograph, A7:20; A10:12–13

## W

wall-rock reactions, petrography, A8:7  
water content  
enrichment cultures, B6:6  
submarine basaltic volcanic glass, B4:3  
vs. carbon dioxide, B4:6

## X

xenocrysts  
basalt, A1:9  
lithologic units, A13:3–4  
xenocrysts, plagioclase, photomicrograph, A13:17–18

## Y

yttrium  
basalt, A3:9–10; A6:10–11; A8:11; A9:8–9; A11:12;  
A12:11; A14:8

pillow basalt, A4:7; A5:7  
vs. magnesium oxide, A3:25; A4:18; A5:18; A6:37;  
A7:34; A8:52; A9:22; A10:25; A11:36; A12:42;  
A13:42; A14:29; A15:43

**Z**

zirconium

basalt, A3:9–10; A6:10; A8:11; A9:8–9; A11:12; A14:8;  
A15:11  
isotopic boundary, B1:4–5  
mantle domains, A1:13  
pillow basalt, A4:7  
vs. barium, B1:36  
vs. magnesium oxide, A3:25; A4:18; A5:18; A6:37;  
A7:34; A8:52; A9:22; A10:25; A11:36; A12:42;  
A13:42; A14:29; A15:43

zirconium/barium ratio

basalt, A14:8  
isotopic boundary, B1:5  
mantle domains, A3:10–11; A6:11; A7:12; A9:9–10;  
A13:14; A14:8; A15:12  
mid-ocean ridge basalt, A1:4–5, 12  
vs. barium, A1:4–5, 43–44; A3:26; A4:19; A5:19;  
A6:38; A7:35; A8:53; A9:23; A10:26; A11:37;  
A12:43; A13:43; A14:30; A15:44; B1:32  
vs. lead-206/lead-204 ratio, A1:41

Zone A

alteration, B1:8–9  
basalt, A10:6; A11:13; A12:10–11; A13:14  
depth anomalies, B3:7  
geochemical signals, B1:18  
geology, A1:1–3, 12  
isotopes along-axis profiles, A1:20

lead-206/lead-204 ratio vs. longitude, A1:41  
magnetic susceptibility, B7:5–6  
mantle, B1:16–19  
mantle domains, A9:10; A11:13  
mantle heterogeneity, B3:2–3  
mid-ocean ridge basalt, B2:2–3  
olivine, B2:23  
pillow basalt, A4:7; A5:7  
sediments, A6:8–9  
Southeast Indian Ridge, B1:1–3  
trace elements, A8:12  
Zone A-East, domain distribution, A1:14  
Zone A-West  
domain distribution, A1:14  
isotopic variability, B3:10  
Zone B  
alteration, B1:8–9  
depth anomalies, B3:7  
geochemical signals, B1:18  
isotopes along-axis profiles, A1:20  
magnetic susceptibility, B7:5–6  
mantle, B1:16–19  
mantle heterogeneity, B3:2–3  
mid-ocean ridge basalt, B2:2–3  
sediments, A6:8–9  
Southeast Indian Ridge, B1:1–3  
Zone B4, depth anomalies, B3:7  
Zone B5, depth anomalies, B3:7  
Zone C  
isotopes along-axis profiles, A1:20  
sediments, A6:8–9  
Zone D, sediments, A6:9  
zoning, sediments, A6:35