

Figure F1. Downhole lithologic variation (Expedition 304/305 Scientists, 2006; Lang et al., 2025; McCaig et al., 2025) and biotite/chlorite corona distribution based on thin section observation (this study). mbsf = meters below seafloor.

Figure F2. Biotite/chlorite coronae in plane-polarized (left) and cross-polarized (right) light. A, B. Chlorite corona (305-U1309D-311R-2, 25–28 cm). C, D. Biotite corona (399-U1309D-311R-2, 4–8 cm). E, F. Biotite-chlorite mixed corona (312R-3, 46–50 cm). Rectangles in D and F indicate the backscattered electron imaging areas of Figure F3A and F3B, respectively. Am = Ca-amphibole, Bt = biotite, Chl = chlorite, Ol = olivine, Pl = plagioclase, Sm = smectite.

Figure F3. Backscattered electron images (A–D) and K α X-ray intensity maps (E–H) of representative coronae. A, E. 399-U1309D-311R-2, 4–8 cm. B, F. 312R-3, 46–50 cm. C, G. 399-U1601C-153R-2, 37–39 cm. D, H. 305-U1309D-205R-2, 91–93 cm. Fe-rich opaque minerals (brightest in backscattered electron images) are mainly magnetite with minor sulfides. Am = Ca-amphibole, Bt = biotite, Chl = chlorite, Ol = olivine, Pl = plagioclase (P- = primary, S- = secondary), Tlc = talc.

Figure F4. Chemical compositions of biotite/chlorite in coronitic aggregates. A. $\text{Al}_2\text{O}_3\text{--K}_2\text{O--Na}_2\text{O}$ mole ratio. B. Na + K versus Si per formula unit (calculated on the basis of 22 oxygen atoms). C. Na + K (22 oxygen atoms) versus H_2O wt% estimated from residuals of total amounts of analyzed oxides and halogens. Compositions of corona-forming biotite and chlorite from the Atlantis Bank (Nozaka et al., 2019) are shown for comparison.

Figure F5. Na + K versus Si per formula unit (calculated with 23 oxygen atoms) of calcic amphibole in coronitic aggregates. Compositions of corona-forming amphibole from the Atlantis Bank (Nozaka et al., 2019) are shown for comparison.

Figure F6. Representative Raman-shift spectra of biotite/chlorite layers in three types of coronae. A. Biotite corona (399-U1309D-311R-2, 4–8 cm) (shown in Figure F2C, F2D). B, C. Biotite–chlorite mixed domain (B) and chlorite-dominant domain (C) of a heterogeneous corona (312R-3, 46–50 cm) (shown in Figure F2E, F2F). Diamonds = positions of characteristic peaks of biotite (solid) and chlorite (open) detected in an olivine gabbro from the Atlantis Bank (Nozaka et al., 2019).