

Biotite–Brine Interactions under Acidic Hydrothermal Conditions

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EFRC: Nanoscale Control of Geologic CO₂

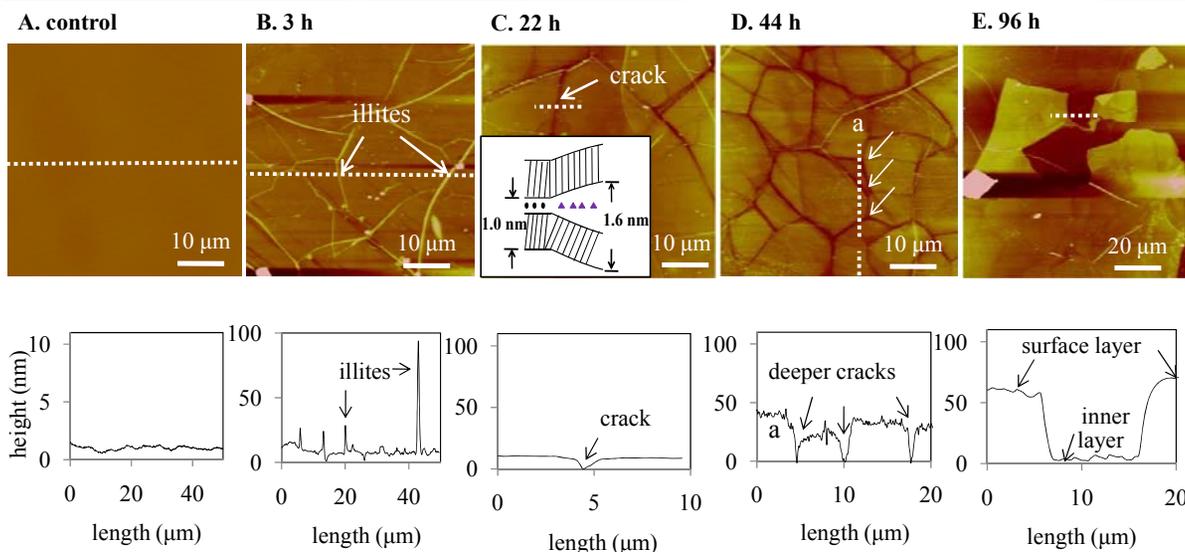


Figure 1. Observations of biotite basal planes with contact mode AFM before and after reaction of single biotite flakes in 1 M NaCl at 95°C and 102 atm CO₂ for different times.

- Na⁺-K⁺ ion exchange promoted the fibrous illite precipitation.
- It also caused the swelling and cracking of biotite basal plane, which accelerated biotite dissolution.

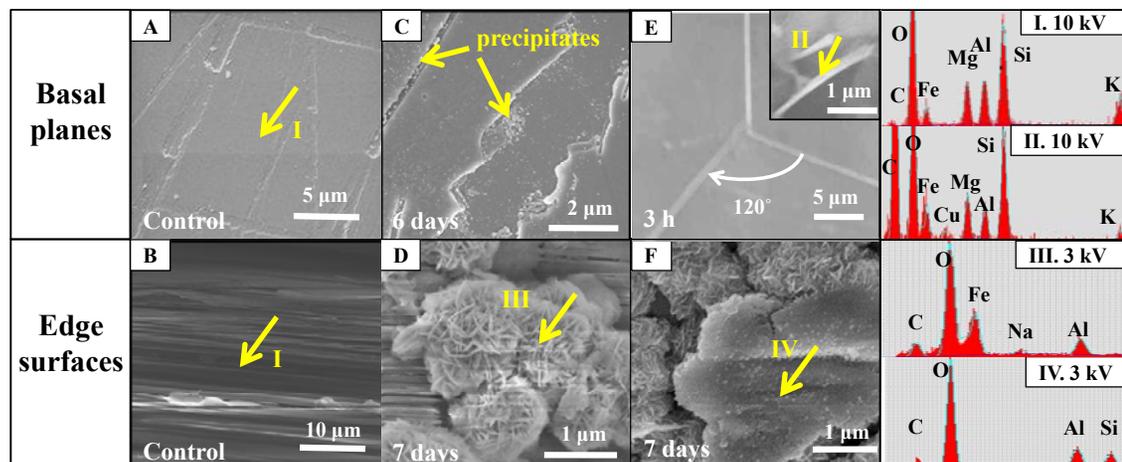


Figure 2. Observations of biotite basal planes and edge surfaces by SEM-EDX before and after reaction in 1 M NaCl solution at 95°C and 102 atm CO₂.

- Fibrous illite precipitated at the basal plane. Fe-enriched precipitates preferentially formed at step sites.
- Al-substituted goethite and kaolinite precipitated on the edge surfaces.

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