
Reactions Between Clay Volatiles and Calcite Reinvestigated

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Abstract: Calcite crystals exposed to clay volatiles react with some components of these volatiles, giving rise to a variety of surface morphologies. F, Cl, and S in different proportions were detected by electron microprobe analysis of the calcite surfaces. Under identical experimental conditions, volatiles from every clay mineral examined caused a specific morphology and chemical composition of the calcite surfaces, but these varied with temperature of the calcite. Changes in pH values and mass spectra of the volatiles after passage through calcite demonstrate that even on rapid heating some clay volatile-calcite reactions occur at temperatures as low as 150° C. Species other than those detectable by electron microprobe analysis also participate in the reactions in which CO₂ is liberated.

Key Words: Calcite • Clay volatiles • Mass spectra • pH measurements • Surface morphology

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