Anhydrite: An important sulfur binder limiting the climatic impact of subaerial volcanic eruptions

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Abstract: Gaseous sulfur compounds are critical climate active volatile components released by volcanoes. Volcanic eruptions can emit massive amounts of H₂S and SO₂ into the atmosphere, which react with oxygen and H₂O to sulfuric acid. Formation of H₂SO₄ aerosols, which have on a geological timescale short-term residence times of month or years, may have global climatic impact. The phase stability of sulfur-bearing minerals such as anhydrite in erupting magmas may be a key controlling factor limiting SO₂ emission during subaerial volcanic activity (Huang and Keppler, January 2015 issue of American Mineralogist). Keywords: Sulfur fluid/melt partition behavior, anhydrite stability, degassing, volcanic eruptions