

# THERMAL DISTURBANCE CAUSED BY ALTERATION OF CRYSTALLINE ROCKS

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Chemical alteration of crystalline rocks → acquisition of porosity and permeability + **generation of heat**. (on the order of  $0.5 \text{ GJm}^{-3}$ )

**Problematic:** Is it possible that this heat leaves a **significant thermal signature such as hydrothermalism?**

**Development:** the rate of heat generation is the product of the heat per unit volume by the **velocity of the chemical front  $V$**

**Answer:**  $V$  is small **on average** so that alteration induces **negligible** thermal effects ( $\ll 0,1^\circ\text{C}$ )

**Except** in case of sudden bursts with high  $V \rightarrow$  **transient thermal anomaly**

**Related question:** is it possible that the velocity of the chemical front  
This is discussed on the basis of coupled alteration model with reaction induced cracking