Pore-network modeling of single-phase reactive transport and dissolution pattern evaluation

Scientific Achievement
The mapping of dissolution regimes and the construction of $k$-$\phi$ relationship curves using pore-network modeling (PNM) and a novel quantitative criteria are explored.

Significance and Impact
Fundamental understanding of the dissolution patterns in a porous medium is crucial for geological CO$_2$ storage, as such mineralogical alterations may be of concern for the safety and efficiency of the technique.

Research Details
- Reactive transport and mineral dissolution were simulated using PNM.
- Geometry changes were considered.
- Dissolution regimes were evaluated by qualitative and quantitative criteria (standard deviation).
- Behavior diagrams were constructed based on dimensionless numbers (Pe, Da and PeDa).
- $k$-$\phi$ relationship curves were investigated.

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