Comparative solubility of minerals III:
Explanations via bond strength and cation-cation repulsions

These cartoons explain trends in data shown in Part I of this series and explained with text in Part II of this series. This page is only a mechanism to provide easier viewing of the cartoon-graphs.

Fluorides and oxides:
Attraction of cation to anion dictates solubility.

Nitrates and sulfates:
Repulsion between inter-radical cation (●) and intra-radical cation (●) dictates solubility, trumping cation-anion interaction.

Fluorides and oxides:
Attraction of cation to anion dictates solubility.

Solubility

Weaker attraction

Stronger attraction

Cation radius

Ionic potential

Less repulsion

Greater repulsion

Cation radius

Ionic potential

Large cation of low ionic potential (e.g., K⁺ or Sr²⁺)
Smaller cation of higher ionic potential (e.g., Li⁺ or Be²⁺)
Very small highly charged cation of great ionic potential (e.g., N⁵⁺ or S⁶⁺)

O²⁻ or F⁻
Radical group (e.g., NO₃⁻ or CO₃²⁻)