# Partial melts from thick lower continental crust: geochemical characterization and identification

Y.-S. HE[1]*,[2], S.-G. LI[1], J. HOEFS[2], F. HUANG[3] AND S. LIU[1]

[1]School of Earth & Space Sciences, University of Science & Technology of China, Hefei, 230026, China (*correspondence: heys@mail.ustc.edu.cn)

[2]Department of Geosciences, University of Göttingen, Goldschmidtstr.1, 37077, Germany

[3]Institute of Geochemistry and Petrology, ETH Zurich, 8092 Zurich, Switzerland

It has been argued that whether high Sr/Y and La/Yb in granitoids reflect deep melting (garnet dominant and plagioclase poor) of mafic rocks in contiental settings [1]. This study presents comprehensive elemental data of granitoids and mafic enclaves from the Dabie orogen to focus on this issue and reveal additional indicators of melting of thickened lower continental crust (LCC).

On the basis of Sr/Y ratios, samples can be grouped into two magma series: i) high Sr/Y granitoids (HSG) and ii) normal granitoids with low Sr/Y. Relative to normal granitoids, the HSG display the following distinct chemical features: (1) highly depleted in heavy rare earth element (REE) relative to middle and light REE with $(Dy/Yb)_N$ and $(La/Yb)_N$ up to 3.2 and 153, respectively; (2) at the same $SiO_2$ and CaO contents, the HSG have significantly higher Sr than normal granitoids, defining two different trends in diagrams of Sr versus $SiO_2$ and CaO; and (3) positive correlations among Sr/Y, $(Dy/Yb)_N$, and $(La/Yb)_N$ in the HSG, but not in the normal granitoids.

Mixing between mafic melt and normal granitoid or differentiation of mafic melt cannot produce the majority of the HSG, as mafic enclaves and normal granitoids have lower Sr contents, and no correlations of Sr/Y, $(La/Yb)_N$, $(Dy/Yb)_N$, and Sr/CaO with $SiO_2$. The HSG have large variation of $(Dy/Yb)_N$, which is higher than in old crustal rocks, arguing against inheritance of the high $(Dy/Yb)_N$ from source rocks. Instead, the chemical features of the HSG are best explained by deep melting of the thickened LCC. Garnet might play a dominant role, while plagioclase may not be important in the source of the HSG, thus the partial melts should have high Sr/Y, $(Dy/Yb)_N$, and $(La/Yb)_N$ ratios and positive correlations among them. High $(Dy/Yb)_N$ and Sr trends observed in the Dabie HSG may be generally applied to distinguish adakites from pseudo-adakites without clear implications for melting depth.

[1] Moyen. (2009) Lithos. **112**, 556-574.

# Experimental and simulation studies of bulk water and hydration water at interfaces

TERESA HEAD-GORDON

Department of Bioengineering, University of California, Berkeley, CA 94720

My talk describes an experimental and theory/simulation study of water studied as bulk, solution, and under spatial confinement. Using x-ray scattering, quasi-elastic neutron scattering, and/or atomistic and coarse-grained chemical models combined with simulation, we address fundamental questions about the origin of waters thermodynamic and dynamic anomalies, the microscopic features of the potential energy landscape that define the origin of these anomalies, and ways to modify interfacial chemical properties to exploit these anomalies for nanoscale function