# Melting of mixed continental crust and depleted peridotite: Potassium rich magmatism from a phlogopite-free source

YU WANG[1,*], STEPHEN F. FOLEY[1] AND DEJAN PRELEVIĆ[2]

[1] [arc centre of excellence for core to crust fluid systems/gemoc; department of earth and planetary sciences, macquarie university, nsw 2109, australia]

[2] [Institute of Geosciences, University of Mainz, Becherweg 21, Mainz 55099, Germany]

To better constrain the processes by which subducted continent-derived sediment and the overlying mantle wedge react and produce hybrid magmas, we performed a series of piston-cylinder interaction experiments involving continental crustal sediment (natural Q-phyllite, Serbia) and depleted peridotite (natural dunite, Tibet) at 1000-1100°C, 2-3 GPa. Results were compared from two different capsule preparation methods; firstly reaction experiments in which blocks of phyllite and depleted peridotite were juxtaposed, and secondly, mixed experiments in which powders of the two rocks were intimately mixed. In reaction experiments, a clear hybridization zone dominated by orthopyroxene is identified between dunite and phyllite but no hybridized melt was formed, whereas in mixed experiments no such reaction belt feature was present, but hybridized melts scattered all over the charges.

Siliceous melts of sediment exert a much greater effect on trace element signatures during sediment-peridotite interaction than does peridotite. The sediment-peridotite (melt-rock) ratio at the slab/mantle interface where infiltration melting occurs is thus a key factor in controlling elements in subduction zones. There was a remarkable resemblance of trace element distributions between hybridized melts produced in this study and Mediterranean K-rich lavas, implying that the hybridization processes might account for the characteristic geochemical features observed in some orogenic lavas from Alpine-Himalayan belt. The absence of K-rich minerals, especially phlogopite, indicates that K-rich post-collisional magmatism could be induced at shallow depth via hybridization between continent-derived sediment and depleted peridotite without the need for residual phlogopite.

***correspondence: yu.wang33@students.mq.edu.au**