

# **Diapir Melting of Subducted Mélange Generating Alkaline Arc Magmatism and Its Implications for Material Recycling at Subduction Zone Settings**

KEDA CAI

China University of Geosciences, Beijing

Presenting Author: [caikd@cugb.edu.cn](mailto:caikd@cugb.edu.cn)

Alkaline rocks crop out in subduction-related volcanic arcs globally, whose genesis is explained by partial melting of hybrid diapiric mélanges in the mantle wedge. Such a new model has not yet been evidenced by field-based investigations, where mélanges and alkaline arc rocks have spatial-temporal and genetic connections. In this study, we identified these two types of rock units exposed in Western Tianshan, and established their petrogenetic relationship through field, geochronologic, geochemical, and thermodynamic investigations. Our results suggest that partial melts produced by melting of the mélange matrix at pressures of 2.8–2.4 GPa and 1.8–1.4 GPa with temperatures of 1000–1200°C can replicate the major-element contents and trace-element abundances of the regional alkaline arc rocks. This finding not only supports the hypothesis that diapir melting of subducted mélanges has a capacity to generate alkaline arc magma, but also provides insight into material recycling at subduction zone settings.