Metamorphic evolution and tectonic implications of carbonate-bearing mafic boudins and surrounding metasediments of the Tianshan Mountains (NW China)

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The metamorphic belt in the southern Tianshan Mountains of NW China provides the opportunity to investigate both the metamorphic evolution of mafic rocks (upper oceanic crust with rarely preserved pillows) during subduction and the exhumation mechanisms in a subduction channel (mafic rocks as boudins enclosed in metasediments). The (U)HP-LT rocks (blueschists, eclogites and metasediments; as in many (U)HP terranes, voluminous schists enclose rare eclogite lenses and layers [1]) are interpreted to represent part of a tectonic mélange formed along a suture zone between the Yili-central Tianshan and Tarim plates ([2],[3]).

This study provides detailed information on the metamorphic evolution of both metasedimentary host rocks and mafic boudins of the (U)HP-LT metamorphic belt. Profiles across different mafic boudins and enclosing metasediments were investigated (whole rock major and trace element geochemistry by XRF and LA-ICP-MS, mineral chemistry by EMPA, thermobarometry, P-T pseudosection modeling using PerpleX) in order to constrain potential protoliths and differences in peak P-T conditions between distinct mafic boudins, and also between metasediments and mafic boudins. Furthermore, metasomatism of the subducted rocks was investigated. This study aims to increase our understanding of the metamorphic evolution of mafic rocks during subduction, the detachment from the subducted slab and the mixing of different materials and metamorphic reactions in the subduction channel during exhumation.

All eclogites investigated contain a variable amount of carbonate minerals. Thus, in addition the carbon cycle in subduction zones is addressed in the context of the P-T evolution.

[1] Lü *et al*. (2012) *J. Metamorph. Geol*. **30**, 907-926. [2] Gao *et al*. (1999) *J. Metamorph. Geol*. **17**, 621-636. [3] van der Straaten *et al*. (2008) *Chem. Geol*. **255**, 195-219.

The Joy of Making Planets in Disks: Dynamical and Chemical Recipes

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Cirucmstellar disks are an outcome of the star formation process, and their physical properties set the initial conditions of planet formation. Yet the total mass, orbital radius, mean density, and composition of planets formed in these disks depends critically on dynamical processes and the transmutation of the initial ingrediants (gas and dust from the interstellar medium) through chemistry. Here we review some of the key physical and chemical processes in disks that dictate the composition of forming planets. In particular we focus on new observational results that constrain theories of planet formation.

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