



## **Field work and stable isotope composition of the white schist (Monte Rosa Nappe, Ayas Valley Italy): implication for their formation.**

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White schists can be found along alpine shear zones within pre-alpine the granite bodies that underwent high pressure metamorphism. They are often interpreted to be the result of a hydrothermal alteration during alpine deformation. We studied lobate white schist bodies within the Monte Rosa nappe (Val d'Ayas, Italy) which are only slightly deformed. They occur in outcrops totally surrounded by the early Permian Monte Rosa granite above the Mezzalama hut. The contact between granite and white schist is typically gradual on a centimetre scale. Indeed, quartz porphyroblast of the Mt Rosa granite are found within the white schist clearly demonstrating their granite origin in agreement with Pawlig and Baumgartner (2002). The contact is overprinted by the weak schistosity associated with the HP alpine event. Bulk rock oxygen isotope compositions of white schists are between 7.7-9.1 per mille  $\delta^{18}O$  (SMOW). The surrounding granites has consistently higher values between 11.05-11.20 per mille (SMOW). This observation is consistent with a pre-alpine, hydrothermal alteration event producing local chlorite-serisite alteration within the granite as proposed for the origin of the white schists by Pawlig & Baumgartner, (2001). The hydrogen isotopes white micas from the white schists show values between -37.55 to -39.13 per mille. They are similar to the values obtained for the granite by Frey & al. (1976). This suggests that hydrogen re-equilibrated during the alpine high pressure event documenting a high hydrogen mobility. Similar differences in mobility were observed by Pawlig and Baumgartner (2001) for strontium and argon in a white schist caught in a shear zone near by. Here strontium re-equilibrated partially during the alpine event, while Argon ages yielded ages as old as 270 Ma which corresponds to the intrusion age of the granite.

Frey, M., Hunziker, J.C., O'Neil, J.R. and Schwander, H.W.1976. Contrib. Mineral. Petrol. 55, 147-179. Pawlig, S. Cosca., M.A. and Baumgartner, L.P., 2001: Abstr. DMG, Beih. J. Min. 13/1, 138. Pawlig, S., Poller, U., Baumgartner, L.P. and Todt, W. 2001, Eur. J. Min