SHRIMP zircon U-Pb dating for metarhyolites from the Kangbutiebao Formation of the Altay orogenic belt, Xinjiang

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The Altay orogenic belt (AOB) is situated between the south Siberian Sayan block to the north and the Junggar block to the south [1]. The AOB consists of several fold belts or tectonostratigraphic units [2], and is also an important metallogenic belt in China. Many economic deposits, e.g. Kaktal Pb-Zn deposit, Mengku iron deposit, Abagong iron deposit, Tiemuerte Pb-Zn deposit, Keyinbulak Cu-Zn deposit, etc., are hosted in the Kangbutiebao Formation, located in the southern margin of the AOB. The Kangbutiebao Formation is mainly composed of low grade marine metamorphosed volcanic rocks and sedimentary rocks, and the rock associations are different in Kelang, Maizi and Chonghuer basins. Whether it was formed in an active continental margin or passive continental margin, the Kangbutiebao Formation has been generally assigned to the Early Devonian. However, its precise age is uncertain. We undertake the SHRIMP zircon U-Pb method to define the age of the Kangbutiebao Formation. The result of 412.6±3.5Ma from matarhyolites in the Abagong iron deposit indicates a late Silurian magmatic event, which provides an important piece of new evidence to understand the tectonic evolution of AOB and the metallogenesis of these ore deposits.

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[1] Xiao *et al.* (1992) *Tectonic Evolution of the Northern Xinjiang and its Adjacent Region*. Beijing, Geological Publishing House, 180p (in Chinese with English abstract). [2] Wang T. *et al*. (2006) *J. Geol.* **114**, 735-751.

Why neutron scattering should be in the geoscientist's toolbox

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With the advent of new, more powerful, neutron sources and major improvements in neutron spectrometer and diffractometer instrumentation along with sample environment equipment, neutron scattering is becoming more popular for geoscience problems. Traditionally, geoscientists have been under-represented at neutron user facilites worldwide. Today they are clearly identified as one of the up-and-coming user communities with the potential for significant growth.

Sample environments that mimick a wide range of geologic conditions (P, T, H, μ, t, etc.) are available or can be constructed to study various chemical and physical behavior. The ability to control simultaneous variables, such as P and T, H and T, μ and T, etc. is improving greatly. The time-of-flight experiments at spallation neutron sources are well suited for kinetic studies. The high penetration of neutrons into most materials makes complex sample environments fairly routine. General methods include diffraction, small-angle scattering, inelastic scattering, and imaging. Focused workshops in recent years are providing good starting points for new users [1, 2].

A suite of neutron scattering instruments is now coming online at the newly constructed Spallation Neutron Source and the upgraded High Flux Isotope Reactor, both at Oak Ridge National Laboratory, which is providing unprecedented neutron flux for most kinds of experiments. Of particular interest, the SNAP diffractometer, a dedicated instrument for high pressure experiments (both powder and single-crystal samples), is now in commissioning.

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