

## A new structure of Xenon clathrate hydrate

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A unique clathrate hydrate structure, previously known only hypothetically, has been synthesized at high pressure and recovered at 77 K and ambient pressure. These samples contain Xe as a guest atom and the same structure may exist in other hydrates too. Details of this previously unobserved structure are described here, most notably the host-guest ratio is similar to the cubic Xe clathrate starting material. After pressure quench recovery to 1 atmosphere the structure shows considerable metastability with increasing temperature ( $T < 160$  K) before reverting back to the cubic form. This evidence of structural complexity in compositionally similar clathrate compounds indicates that the reaction path may be an important determinant of the structure, and impacts upon the structures that might be encountered in nature.

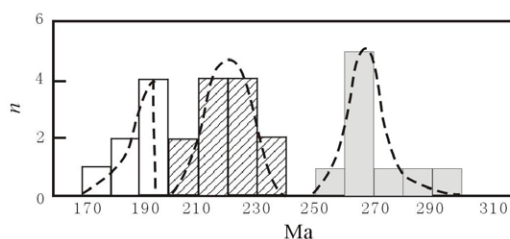
## The chemical Th-U-Pb ages of monazite from the Yangshan gold deposit, China and their geologic and metallogenic implications

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For the first time, the chemical Th-U-Pb ages of monazite were successfully applied to determine the metallogenic time of Yangshan gold deposit, which is the largest Carlin-like type gold deposit in China and the sixth largest in the world [1, 2, 3, 4]. On electron microprobe, the author analyzed the contents of Y, Th, U and Pb in monazites in sulfide veinlet cutting granite-porphyry dykes, and then calculated their apparent ages and isochron ages using ChemAge procedure. The apparent ages cluster into three groups (Fig.1).



**Figure 1:** The histogram of ages of monazite.

Group 1 includes nine analyses spotted on the cores of monazites, with apparent ages ranging 297 ~ 251 Ma, and gives an isochron age of  $268 \pm 4$  Ma (MSWD=0.24), representing Late Paleozoic arc-magmatism induced by northward subduction of the Mian-Lue Ocean. Group 2 includes twelve apparent ages ranging 237 ~ 207 Ma and yields an isochron age of  $220 \pm 3$  Ma (MSWD=0.20). This age records the crystallization of the granite-porphyry dike and accords with the beginning time of the large-scale collision-type granitic magmatism in western Qinling Orogen. Group 3 contains seven analyses spotted on the margins of monazites, yielding apparent ages of 200 ~ 179 Ma and an isochron age of  $190 \pm 3$  Ma (MSWD=0.15), which must be the metallogenic time of the Yangshan gold deposit.

- [1] Chen *et al.* (2004) *Geological Review* **50**, 134–152.
- [2] Chen *et al.* (2007) *Acta Petrologica Sinica* **23**, 2085–2108.
- [3] Chen *et al.* (2009) *Acta Petrologica Sinica* **25**, 2695–2726.
- [4] Yan *et al.* (2008) *Acta Geologica Sinica* **82**, 804–810.