The determination of a Neopaleozoic alkaline rock belt in the northern margin of the North China Craton

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The North China Craton (NCC) has an tectonic evolution history of 3.8 Ga. It has been reported that there are hundreds of alkaline intrusive complexes from the Proterozoic to the Cenozoic in the NCC. So far, seven alkali rock belts have been confirmed, including four nearly EW-trending Paleo-Mesoproterozoic and early Mesozoic belts respectively in the northern and southern margin of NCC, and three NNE-orientated late Mesozoic belts along the deep fracture zones and their both sides from Eastern China[1][2].

Recently, For the first time, based on systematic lithogeochemistry and high precision U-Pb isotopic dating, a Neopaleozoic alkaline rock belt nearly EW-orientated in the northern margin of the NCC has been discovered and determinated. The belt longer than 400 kilometers consists of three alkaline complexes in the north of Yinshan Mountain and the other two in the north of Yanshan Mountain. They are all the product of Devonian alkaline magmatic activities, Huangheshao alkali feldspar syenite (410.1±6.2 Ma), Gucheng alkali syenite (399±7 Ma[3]), Shuiquangou alkaline syenite (380~390 Ma[4]),and Badaogou-huangtuyao hornblende syenite (373±3 Ma).

The formation of the Devonian alkaline rock belt may has relation to the extensional setting after arccontinent collision in the north margin of the NCC. The discovery of the belt is not only of great significance for study on the geological tectonic evolution of the north margin of the NCC, but also for the discussion on the relationship between the two tectonic units of the Xing'an-Mongolian Orogenic belt and the NCC.

[1] Cai et al. (2011) JJU (Ear. Sci. Ed.) 41(6),1901-1913.[2] Yan et al. (2007) GJCU 13(2),161-174.[3] Wang et al. (2012) Acta Petro. Sin. 28(1):2843-2854.[4]Luo et al. (2011) Geochimica, 30(02):116-122