Geochemical investigation of crude oil samples from West Siberia Megabasin

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Results of the geochemical investigation of 30 samples of crude oil from different West Siberian oil fields are presented. To determine a distribution of rare, rare-earth and platinoid group of elements in the samples ICP-MS analyses with high resolution mass-spectrometer and preliminary acid distraction was used. The experimental results obtained show that terrigen fine-grained rocks composing reservoir layers of Tyumen' and Abalak suites are characterized by Rh-Ir specialization. While the samples of crude oil extracted from these rocks have Pd-Ru specialization. Study of samples of bitumen located in source rocks of the Bazhenov suite show that the samples investigated have Pd-Rh specialization.

The results obtained together with theoretical and previous experimental results [1, 2] give us the possibility to suggest that accumulation and/or transformation of oil deposits in West Siberian Mega basin could take place at essential influence of deep fluids.

[1] Letnikov (2005) *Proc. Russ. Acad. Sci.* **402**, 205.
[2] Kutcherov *et al.* (2002) *Proc. Russ. Acad. Sci.* **387**, 789.

The paleomagnetism and age of the Modipe Gabbro, South Africa

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The Precambrian Modipe Gabbro outcrops as isolated hills along the South Africa-Botswana border and was the focus of an influential paleomagnetic study by Evans and McElhinny (1966) that is frequently used to anchor the apparent polar wander path of the Kaapvaal craton. The characteristic remnant magnetization (ChRM) of the intrusion was reported to be held by elongate, single-domain inclusions of magnetite exsolved in pyroxene and characterized by high median destructive fields (~40-60 mT). Until recently, the emplacement age of the Modipe Gabbro was poorly constrained and the only available ages were those of McElhinny (1966): a Rb-Sr date of 2630 ± 470 Ma and a series of K-Ar dates measured from a pyroxene mineral separate ranging from 2600 to 3000 Ma.

We report U-Pb analysis of ten single grains of baddeleyite (ZrO_2) yielded a $^{207}Pb/^{206}Pb$ age of 2784.0 ± 1.5 (2σ) Ma with an MSWD of 1.7. This is by far the most precise age determination yet for the Modipe Gabbro and is interpreted to reflect the time of emplacement. However, light microscopy reveals an absence of magnetite inclusions of the type described by Evans and McElhinny (1966), and extensive alteration of pyroxene (to actinolite) and plagioclase (to epidote and sericite). Despite the absence of inclusions and the ubiquitous mineralogical alteration, the mean ChRM calculated after alternating field demagnetization (Dec. 189°, Inc. 89°, a_{95} 7.4°) is indistinguishable from that of earlier workers (Dec. 155°, Inc. 85°, a_{95} 5.4°), raising the possibility that the ChRM reported by Evans and McElhinny (1966) is not held solely by pyroxene-hosted inclusions, or conversely, that it is a secondary magnetization unrelated to the age of emplacement.

This age corresponds with that of the nearby Gaberones granite suite (2783-2785 Ma) (Moore *et al.* 1993), and places the Kaapvaal craton at the same latitude as the Pilbara craton based on ca. 2770 Ma flood basalts in Australia (Strik *et al.* 2003; Wingate 1998), supporting the Vaalbara hypothesis in placing the two continents together at ca. 2.8 Ga.