Method development for PGE determination in reference material BIR-1

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Studies using BIR-1 as a reference for HSE and Re-Os isotope analysis are rare and only few data is available. Literature on BIR-1 (Icelandic basalt ca. 48 g/100 g SiO_2) display poorer reproducibilities of Ru and Ir indicating sample digestion problems for Ru and Ir relative to other PGE [1] [2]. Digestions of PGE hosted in silicate phase has been reported incomplete with wet acid digestions and addition of HF acid in combinition with HPAs proves to be effective [3]. An accurate Re determination from silicate phase with sinerting-anion exchange has already been established avoiding use of HF [4]. This study is extended and a method is developed to determine PGE in silicate and hydroxide phases separatly in sintering. Replicates of BIR-1 (0.5 g) has been digested with sintering and after centrifugation, supernatant and hydroxides has been separated and dissolved in dilute and concentrated HCl. To each of the phases PGE-spike has been added as equilibration of spike before centrifugation has not been established. Preconcentration is done with anion exchange chromatography using 8 mol/l, 12 mol/l and 14 mol/l HNO_3. Measurements are performed with Agilent 8800 ICP-MS/MS using different gas modes (Rh and Au with external calibration). Preliminary data for PGE-Re and Au is in good agreement with literature [1] [2] [5] as shown in table 1. As a next step precision of data will be improved using larger test portion masses. Blanks are still unsatisfyingly high for all PGE in particular for Ir, which does not allow quantification.

Table 1. PGE analysis (ng/g) of BIR-1 with sintering-anion exchange Blank corrected

Literature	Ru	Pt	Pd	Re	Rh	Au
Meisel and Moser 2004	0.278	4.3	6.11	0.634		
Ishikawa et al., 2014	0.522	4.39	5.85	0.684		
Bézos et al., 2005	0.542	4.56	6.33			
Mean (n~8) this study	0.550	4.13	4.58	0.659	0.366	4.52
RSD %	4	20	9	2	11	5
Blank (ng/g)	0.06	0.30	0.33	0.18	<0.01	< 0.01

[1] Meisel et al., (2004). *Geost and Geoana Res* **28**(**2**): 233-250. [2] Ishikawa et al., (2013) *Chem Geol* **384**(**0**): 27-46. [3] Meisel et al., (2009). *Geochimica et Cosmochimica Acta* **73**: 867. [4] Bokhari & Meisel (2014) *Min Mag*, **7**(**5**) 1362. [5]. Bézos et al., (2005). *Geochimica et Cosmochimica Acta* **69**(**10**): 2613-2627.