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Are the solubility data for PGEs and Au in haplobasaltic melts applicable to natural basalts?

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Due to experimental and analytical challenges, dry haplobasaltic (Fe-free) analogue of natural basalts is often used to study the solubility of PGEs. We have investigated the solubilities of Rh, Pd, Ir, Pt and Au in H₂O- and Cl-bearing haplobasalt at 1250°C, 200 MPa and at logfO₂ at FMQ+2.5 in IHPV for 24 h. Metal activities were imposed by capsule material of binary alloys (Au₈₀Pd₂₀; $Pt_{90}Rh_{10}$; $Pt_{80}Ir_{20}$). The quenched glasses were analysed using EMPA and femtosecond LA-ICP-MS allowing for the analysis of first ng/g PGEs. The results are in very good agreement with literature data but no deteactable effect of H₂O or increasing Cl content (up to 1 wt%) on PGE solubility was observed. However, our solubility experiments with natural tholeiite at given conditions demonstrate a strong increase in Au and Pd contents with increasing Cl. We attribute this difference to the presence of alkalis and/or Fe in natural melts and we conclude that solubility data for PGEs and Au obtained in haplobasaltic melts should

+ be used with caution when applied to natural magmas. +

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