Melt inclusion study from the upper Deccan Large Igneous Province in Western Ghats (India): Magma source and crystallization history

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To better understand the diversity in geochemical composition and volatile enrichment/ degassing during formation of the Deccan large igneous province (LIP) basalts from the Western Ghats section (India) a melt inclusion study has carried out for clinopyroxenes and plagioclase feldspars. This study signifies the first melt inclusion study of the magmas from the Western Ghats Section of Deccan LIP. The bulk composition of melt inclusions shows a wide range. The inclusions are significantly enriched in TiO_2 (3.68 to 0.08 wt%) and FeO (18.3 to 2.63 wt%). Volatiles are determined to have a wide range in composition in melt inclusions H_2O (0.94 to 3.76 wt%) and CO_2 (1808 to 428 ppm). A range of processes are responsible for the variation in the concentrations of volatiles in inclusions e.g. degasing and diffusion [1]. Post-entrapment crystal aggregates contributed to a change of the parental composition [2]. Compositions are affected by diffusion from the host minerals into the inclusion. Fe-Ti oxides that were trapped along with the melt show inconsistent high temperature of homogenization (i.e off-track from the basaltic melt temperature and retain un-melted crystals in partially homogenized melt inclusions). The shift of the melting sequence (recorded in the inclusions) towards higher temperatures can also probably be explained by post-entrapment changes and re-equilibration with the host crystal as the temperature dropped.

[1] Sobolev A.V et al. (2015) Volcanism and Global Environmental Change: Cambridge University Press, *147-163*. [2] Danyushevsky et al. (2002) *Chemical Geology* **183**, *5-24*.