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The 2012 Fissure Tolbachik Eruption: Preliminary Results of Petrological Investigation

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The most recent eruptive activity at Tolbachinsky Dol, Kamchatka, started on November 27, 2012 with vigorous explosive emission of magma from ca. 4.5-km-long fissure formed at the southern flank of Plosky Tolbachik Volcano. Within two days from its onset the eruption produced two massive, blocky lava flows, each of which propagated for nearly 10 km, covering an area of $\sim$14 km^2 total. By mid-December the eruptive activity lessened and narrowed to a single vent in the southern part of the fissure, which continued to feed lava flows during the year 2013.

The eruptive products of the first two days of eruption are characterized by relatively wide compositional variations (53.0 – 55.2 wt.% SiO_2, 3.07 – 3.99 wt.% MgO, 2.48 – 2.75 wt.% K_2O) and high degree of textural heterogeneity, e.g. presence of smeared mafic bands and crystal clots. Within several days from the eruption onset the magma composition became more homogeneous, yet more primitive (52.0 – 52.6 wt.% SiO_2, 4.16 – 4.35 wt.% MgO, 2.46 – 2.51 wt.% K_2O), and remained constant until August 2013, throughout the studied period of eruption. We use whole-rock composition of erupted magmas and composition of mineral phases to identify potential sources for the newly erupted products and to put constrains on timing of magma recharge.