SILICATE INCLUSIONS IN THE ELGA (IIE) IRON. S. N. Teplyakova[1], M. A. Nazarov[1]. Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Sciences. E-mail: svun2002@mail.ru.

Introduction. Silicate inclusions (SIs) in irons are rare and were documented in 8 IIE meteorites. These inclusions can vary in composition from chondritic SIs in Netschaevo to 'differentiated' ones in Colomera and Kodaikanal. Previous investigations of silicate inclusions in IIE irons suggested that SIs were probably formed by the partial melting of H-chondrite precursors or by condensation of the solar nebula gas [1-4]. Here we report on mineralogy, petrology and mineral chemistry of fifteen SIs of the Elga (IIE) meteorite.

Results: The Elga SIs consist of euhedral and skeletal pyroxene crystals ($Wo_{37-44}En_{44-50}$; Cr_2O_3 1.5 wt%; Fe/Mn=15-31) embedded in a SiO_2-rich feldspatic glass ($Ab_{72-92}Or_{7-26}$ to $Ab_{38-43}Or_{53}$). Mineral modes (vol%) are pyroxene 22-34; glass 66-78. Minor phases are bronzite, chromite (TiO_2 5.5 wt%), whitlockite, F-apatite, taenite, troilite, kamacite, pentlandite and swathing schreibersite. Some inclusions consist of glass only. The glass has normative composition (wt%): silica 70, feldspar 30 ($Ab_{30}Or_{70}$). The mean bulk composition of the SI silicate portion is (wt%): SiO_2 66.76±3.67; TiO_2 0.42±0.05; Al_2O_3 12.83±0.63; Na_2O 4.34±0.51; K_2O 2.13±0.31; CaO 5.84±2.07; MgO 3.77±0.28; MnO 0.08±0.01; FeO 2.14±0.13; Cr_2O_3 0.26±0.03; P_2O_5 3.28±2.52. One SI analyzed with INAA shows a large negative Eu anomaly and enrichment in LREE (25 x CI).

Discussion: Similar to some SIs of IIE irons the Elga SIs have granitic composition. In chemistry and mineralogy, the Elga SIs are close to SIs of Kodaikanal (IIE) [2], cryptocrystalline inclusions of Miles (IIE) [1], glassy SIs of Weekeroo Station (WS 2, 7, A) (IIE) [4] and SIs of ungrouped Sombrerete and Guin irons. However SIs of Elga are higher in K, Na, and Si compared to those in other IIE irons. Granitic clasts of similar composition were reported also in some stone meteorites: Adzhi-Bogdo (LL), the GRA 06128/06129 ungrouped ureilite, polymict ureilites (DaG 164/165, DaG 319, DaG 665, EET 83309, EET 96001, FRO 93008), and lunar meteorites (Dhofar 925, 960) [6-8]. The REE pattern of the Elga SIs points to a differentiated precursor. The prominent negative Eu anomaly suggests that feldspar could be lost during crystal-liquid fractionation. The SI composition is controlled by redox reactions. Fe/Mn ratios and MG# of the SIs show negative correlation that indicates FeO reduction. Whitlockite is in a direct contact with schreibersite and, therefore, confirms the redox reactions. Based on the bulk composition and the REE data we conclude that the Elga SIs originated from a differentiated precursor which was mixed with the Elga IIE metal and reduced due to metal-silicate reactions.

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