

## Igneous and impact processes on a ureilite parent body inferred from Y-983890 polymict ureilite

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Ureilite is the second largest group of achondrites. They are largely divided into two types: monomict and polymict. Most ureilites are monomict ureilites, whereas polymict ureilites are relatively rare. Polymict ureilites are polymict breccias containing lithic clasts and mineral fragments of various lithologies [1]. Therefore, it provides valuable information about igneous and collisional processes on ureilite parent bodies. Yamato (Y-) 983890 is a recently classified new polymict ureilite [2]. In this study, we conducted careful petrographic observations on this new polymict ureilite.

Y-983890 consists of lithic clasts and mineral fragments which show a large variety of lithologies. Most of them are monomict ureilite-like materials. They consist of coarse-grained (up to 1 mm) olivine and/or pyroxene (pigeonite, orthopyroxene, and minor augite) with interstitial dark carbonaceous materials and/or graphite. The chemical compositions and Fe/Mg-Fe/Mn relations of olivine and pyroxene are consistent with those of monomict ureilites [3].

Non-monomict ureilite-like materials include feldspathic clasts, dark clasts, a chondrule fragment, and others. We identified several distinct feldspathic clasts. They show different igneous textures and different chemical compositions of constituent minerals (feldspar and pyroxene). Some of the feldspathic clasts are considered to be basaltic counterparts complementary to monomict ureilites (ultramafic residues). The dark clasts consist of fine-grained phyllosilicate-rich matrices with variable amounts of opaque minerals such as magnetite and sulfides (pyrrhotite, pentlandite). These dark clasts mineralogically resemble the matrices of CI carbonaceous chondrites. A chondrule fragment was also identified. It shows a barred olivine chondrule texture. The chemical composition of the olivine is in the range of that of H chondrite. The dark clasts and the chondrule fragment are considered to be fragments of impactors collided with the parent body of Y-983890.

- [1] Goodrich C. A. *et al.* (2004) *Chemie der Erde*, 64, 283–327. [2] Yamaguchi A. *et al.* (2012) *Meteorite Newsletter*, 21. [3] Goodrich C. A. (1992) *Meteoritics*, 27, 327–352.

## Organic geochemical characteristics of the coaly Miocene units in the Şahinalı (Aydın) region, Büyük Menderes Graben, Turkey

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In the Şahinalı (Aydın-Turkey) region the Miocene units consist of conglomerate, coal, clayey coal, sandstone, siltstone, claystone, clayey limestone and silicalimestone. Total Organic Carbon (TOC) values in these units range between 0.11-38.13 %. Rock-Eval analyses on core samples with the highest TOC values give hydrogen index (HI) values from 60-566 mgHC/gTOC and oxygen index (OI) values from 31-245 mgCO<sub>2</sub>/gTOC. The organic matter can be classified as Type II and III kerogen on the modified van Krevelen diagram. Tmax values vary between 338 and 429 °C, with an average of 413 °C indicating the diagenesis stage. Based on the microscopic studies, organic matter is composed of predominantly autochthonous algal and amorphous material, with a minor contribution of terrestrial material. The average vitrinite reflectance value is 0.35 %. Vitrinite reflection index and Tmax values indicate that the organic matter is immature. Biomarker characteristics also verify these results. 8 $\alpha$  (H)-22, 29, 30-trisnorhopane Ts/(Ts+Tm) ratio is 0.85. This value indicates immature (Ts/Tm>1) organic matter, while C32 22S/(22S+22R) ratio is determined to be 2.56. Diasterane/sterane ratio is generally low in immature sediments - between 0.08-0.71 in the samples- in spite of the lithology effect. The thermal process is evaluated through the biomarker data during the coalification, and the moretane/hopane ratio shows immaturity and early maturity. One of the maturity parameters derived out of C29 regular sterane is 5 $\alpha$  (H), 14 $\beta$  (H), 17 $\beta$  (H) C29 sterane and 5 $\alpha$  (H), 14 $\alpha$  (H), 17 $\alpha$  (H) C29 sterane ( $\alpha\beta\beta/\alpha\beta\beta+\alpha\alpha\alpha$ ) ratio which is less than 1 in the samples (0.23-0.31). C23/C24 and C28/C29 ratios are between 0.61-2.86 and 0.71-2.95 respectively. 20(S)/(20S+20R) and  $\beta\beta/(\beta\beta+\alpha\alpha)$  sterane ratios indicate immature stage. Oleananes type biomarkers were determined to be 5.52-6.51 derived from the angiosperms. This might indicate angiosperm abundance under deposition conditions.