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ANALYSIS OF QUARTZ MINERAL IN QUARTZ BEDS OF KARAGUM USING ORGANIC SOLVENTS

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Organic solvents with different densities are used to accurately determine the mineral content of the sand deposits of Karakum. When organic solvents of different densities are used, heavy minerals in sand samples are separated from the bottom and light minerals from the top [1]. Finally, the mineral composition of the separated heavy and light fractions is analyzed separately. It is difficult to determine the complete mineral composition without dividing it into heavy and light fractions, since many minerals are stored in the composition of the sand [2]. In this study, sand deposits (Baherden, Anau, Mane) were compared before and after dissolving in organic solvents in terms of the content of silicon element and the purity of quartz. To compare the purity of the sand samples before applying the organic solvent, each sample was first examined in an XRD diffraction analyzer and the data obtained were compared with the X-ray diffraction data of a standard pure quartz mineral. According to this XRD, it can be seen that the peaks detected by the standard quartz (SiO_2) and samples from Mane and Baherden deposits are similar. Thus, it was concluded that the purity level of quartz (SiO_2) stored in Mane and Baherden sand deposits is the same.

Before using the organic solvent, it was observed that the most amount of silicon in the sand samples was stored in the samples of Mane and Baherden deposits by comparing the peaks revealing only silicon element in the XRF spectra of the sand samples. These comparisons are a comparison of the composition of sand deposits (Mane, Baherden, Anau) before the use of organic solvents, and the samples of Mane and Baherden deposits showed the best results in terms of the purity of quartz and the retention of silicon element. In this study, the amount of elements other than silicon was also compared in the composition of the samples of sand deposits before the use of organic solvents . As can be seen from the survey, it was found that there are small amounts of iron and calcium aluminosilicates in the Anev sand deposit. Zirconium element and its compounds were observed to be higher in Baherden and Anew sand samples than in Mane sand deposits. According to the results of the research, there was no significant difference in the extraction of pure SiO_2 between Baherden sand deposit and Mane sand deposit . Investigations were continued on light fractions obtained using organic solvents of different concentrations (N,N-dimethylformamide and tetrabromoethane). By comparing the XRF spectra of the light fractions of the rock samples with only silicon-detecting peaks, it was observed that the Mane deposit sample contains large amounts of silicon. Although samples from Baherden and Mane deposits showed the same high silica retention results when compared before organic solvent application, but when comparing the light fractions obtained using organic solvent, it was observed that Mene sand retained more silicon element than Baherden sand deposit. Purity level of the light fraction of Mane sample has a higher SiO_2 purity level than the light fractions of other samples [3].

As a result, the sand samples of Mane and Baherden show the highest level of sand samples before using organic solvent, and after fractionation using organic solvents, it was concluded that the light fraction of Mane sand sample is the most suitable for obtaining pure SiO_2.

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