

## **GEOLOGICAL, CHEMICAL AND SPECTROSCOPIC STUDY OF DIATOMITE FROM MIDDLE ANATOLIA, TURKEY**

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Diatomite consists of mainly amorphous silica and opal with a disordered cristobalite/ tridymite structure, precipitated as skeletons of diatoms. Impurities of clay, silt, and tuff etc. are common. Physical and chemical properties such as high active surfaces and high silica concentration of diatomite lead to a wide area of industrial applications. A detailed geological, chemical, and spectroscopic characterization helps to solve geological questions such as facies conditions as well as technical questions in regard to absorbency, isolation properties, and applicability as aggregate for ceramics. Here, we investigate geological, chemical and spectroscopic properties of diatomite from a volcanic area in Middle-Anatolia (Turkey), this diatomite is generally of limnic origin. The diatom species are characterized by scanning electron microscopy (SEM).  $^{60}\text{Co}$   $\gamma$  irradiation is performed in order to generate paramagnetic defects. Electron paramagnetic resonance (EPR) measurements at 20 K T 300 K and X-ray diffraction is applied to reveal information about structural defects of silica and mineral phase composition of diatomite. The most important results are: (1) Most frequent diatom species are *Melosira*, *Cyclotella*, *Fragilaria*, *Surirella*, and *Campylodiscus* to occur in freshwater. (2) The diatomite has relative high concentrations of Al and Fe compared to industrial standards due to the presence of clay and feldspar. (3) No Al is substituted for Si in  $\text{SiO}_4$ -tetrahedra of silica, which is indicated by  $\gamma$  irradiation of diatomite and subsequent EPR analysis. (4) Organic radicals are mostly present in irradiated diatomite. (5) All samples exhibit  $\text{Fe}^{3+}$ -complexes of orthorhombic symmetry in silica as well as additional magnetic phases.