

Characterization of the pristine diatomite platelets

According to the XRF analysis, diatomite platelets are mainly composed of silica (SiO_2). Al_2O_3 (about 13%) and Fe_2O_3 (about 6%) are other important constituents of the pristine diatomite platelets. Other impurities are listed in the table 1.

Table 1: The results of XRF analysis

Element	SiO_2	Al_2O_3	CaO	Fe_2O_3	K_2O	MgO	Na_2O	TiO_2
Amount (%)	63	13	2	6	2	2	2	0.5

Nitrogen adsorption/desorption isotherm of the diatomite platelets is shown in figure 1. According to this figure, the shape of isotherm is similar to the IV type isotherms according to the international union of pure and applied chemistry (IUPAC) classification and confirms that diatomite platelets has mesoporous structure.

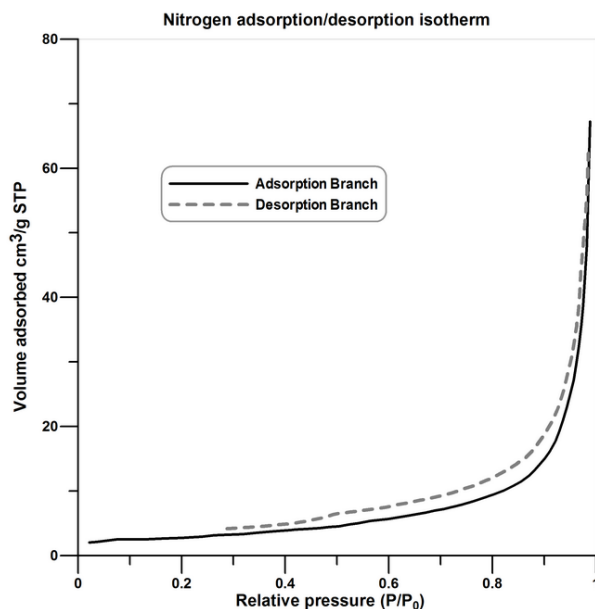


Figure 1: Nitrogen adsorption/desorption isotherm of the pristine diatomite

According to extracted data from the nitrogen adsorption/desorption isotherms, surface area of the pristine diatomite particles is calculated 13.642 m^2/g . Also, average pore diameter is estimated around 34.79 nm.

Figure 2 displays TEM images of the pristine diatomite platelets. According to these images, pristine diatomite sample belongs numerous regularly spaced rows of pores in its structure. In addition, average pore diameter can be estimated around 40 nm.

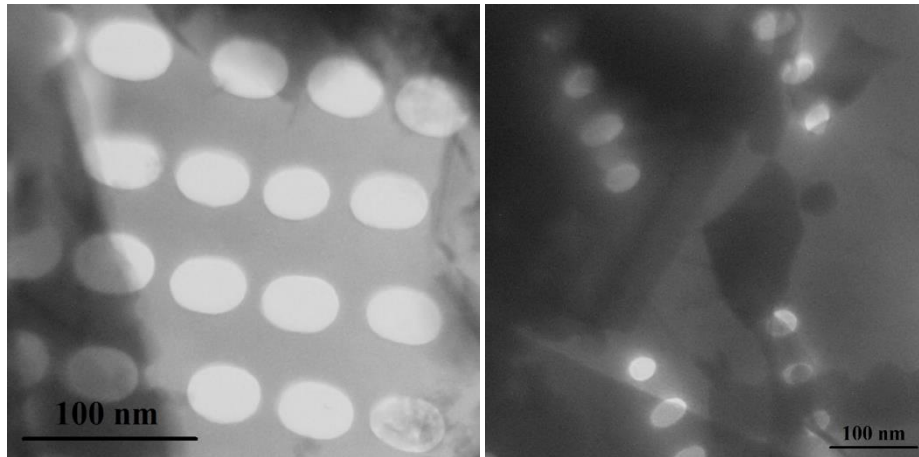


Figure 2: TEM images of the pristine diatomite sample