Dyes are color organic compounds which can colorize the other substances. These substances usually presents in the effluent water of many industries, such as textiles, leather, paper, printing and cosmetics [1]. Wastewater containing dyes can cause serious water pollution problems in the form of reduced light penetration and photosynthesis, and toxicity from heavy metals associated with dyes [2]. The used as a low adsorbent and ecology friendly adsorbent has been investigated as an ideal alternative to the current expensive methods of removing dyes from wastewater. Recently, the interest on biomaterials and especially tannins was growing and some attractive results were obtained in the adsorption of some metals by tannin sorbents [3]. Tannins are widely distributed in natural and have multiple adjacent polyhydroxyphenyl groups in their chemical structure, which have extremely high affinity for heavy metal ions [4], proteins, other macromolecules like polysaccharides [5]. Sumac leaves were collected from the fields of Manisa (Kırkağaç), Turkey and low-cost adsorbent. Sumac (Rhus coriaria L.) is a shrub, which reaches 3-4m in height in the wild. The main compounds present in Rhus family are hydrolysable gallotannins [5]. In laboratory investigations; aqueous solutions of various concentrations (20-400μg.mL⁻¹) were shaken with certain amount of adsorbent to determine the adsorption capacity on sumac-leaves for methylene blue.

The effect of various parameters such as initial methylene blue concentrations, temperatures, contact time and, pH were examined and optimal experimental conditions were determined. Adsorption was conducted using varied initial concentrations of MB solutions and three different temperatures (20, 30, and 40°C). An adsorption time of around 4h was sufficient to reach the equilibrium for all temperatures. At pH 2.0 and 10.0 the sorption of dye was not favorable, while other pH’s (3-8) was remarkable. There was no significant difference in the dye concentration remaining when the pH was increased 3 to 8. Langmuir and Freundlich models were used for this study. The results in this study indicated that sumac leaves was a good adsorbent for removing methylene blue.

References