Due to the increase in anthropogenic emissions of greenhouse gases, several alternatives have been proposed for the capture and storage of CO$_2$. It has been demonstrated that the use of amine-impregnated adsorbent materials is a technology that requires low energy costs and promotes a high purity selective capture. However, these adsorbent materials are synthesized reactive grade precursors. In this work an industrial waste as a precursor in the preparation of mesoporous material type MCM-41, functionalized by wet impregnation in contact with dietanolamine (DEA) and tetraethylenpentamine (TEPA), was used. The industrial waste is generated in the aluminum extraction kaolinite to elaborate aluminum sulfate. The adsorbent material type MCM-41 obtained were characterized by infrared spectroscopy using attenuated total reflectance (ATR), scanning electron microscopy (SEM), BET surface area analysis. Thermal gravimetric analysis (TGA) was implemented for the CO$_2$ adsorption/desorption performance. The IR bands showed an increase with the amine load increases before the pore fills; this was corroborated with surface area analysis. At TEPA loading of 20% wt, the highest CO$_2$ adsorption capacity was obtained. The possibility to obtain a mesoporous material industrial waste was demonstrated with excellent properties to CO$_2$ capture. Moreover, the MCM-41 material obtained could be used in other areas as catalysis and adsorption applications.

**Keywords:** carbon dioxide adsorption, amine-impregnated materials, industrial waste

**Presenting author’s email:** jg.mendoza.al@hotmail.com