

## FUNCTIONALIZATION OF PET WASTE USING PHENOLIC COMPOUNDS

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**Abstract.** *The adsorptive performances of PET waste are very low, for most of metal ions and dyes from aqueous media, and from this reason their use as adsorbent in the environmental remediation processes is inefficient. Increasing the adsorption capacity of PET waste involves improving of the number of superficial functional groups, and this can be generally done by the functionalization with certain chemical compounds. But most of functionalization procedure also implies the dissolving of PET waste in a suitable solvent. In this study, two phenolic compounds (phenol and p-chloride-phenol) have been used for the dissolution and functionalization of PET waste, to obtain new adsorbent materials with applications in the environmental remediation. The preparation of these two adsorbent materials were discusses to highlight the main advantages and disadvantages of each. Also, their adsorptive performances have been tested in case of Cu(II) ions removal from aqueous media*

**Keywords:** PET waste, adsorbent material, functionalization, phenolic compounds, aqueous media

### 1. Introduction

Polymers are substances with very large molecular masses derived from a large number of repeated units. There are both natural polymers and synthetic polymers. Synthetic polymers are commercially available in a wide variety and have a wide range of properties and uses. Such a synthetic polymer is polyethylene terephthalate (PET) having multiple utilities due to its excellent properties [1]. It is well known that plastic products are extremelly difficult to be degraded naturally, although their applicability, stability and durability have made them so popular. There are, however, four ways in which plastics can naturally degrade (photodegradation, thermo-oxidative degradation, hydrolytic degradation and biodegradation by microorganisms), but the processes take a long time. Polymers are widely used materials in various fields because of their valuable properties such as good mechanical properties, low density, low cost and easeness of processing. Total production of plastics is over 230 million tonnes per year,

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