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## ADSORPTION STUDIES OF FLUORIDE BY ACTIVATED CARBON PREPARED FROM MUCUNA PRURINES PLANT

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Activated carbon synthesized from the plant *Mucuna prurines* have been successfully used to remove fluoride from aqueous solution by adsorption method. Batch method adsorption has been studied and the adsorption was found to be very significant. Almost 96% of fluoride could be removed by adsorption. Adsorption studies of fluoride signify the fact that among the different adsorption model, Langmuir adsorption model seems to be more favorable in the present case. Different parameters like effect of adsorbent dosage, contact time, pH and initial concentration are studied to understand the adsorption mechanism.

**Keywords:** activated carbon, fluoride, adsorption, *Mucuna prurines*.

### Introduction

Fluoride is well recognized as an element of public health concern. Fluoride is present universally in almost every water (higher concentrations are found in ground water), earth crust, many minerals, rocks etc. It is also present in most of everyday needs, viz. toothpastes, drugs, cosmetics, chewing gums, mouthwashes, and so on. Though a small amount of it is beneficial for human health for preventing dental cavities, it is very harmful when present in excess of 1 mg/L [1]. World Health Organization (WHO) and IS : 10500 recommend that the fluoride content in drinking water should be in the range of 1 - 1.5 mg/L [2]. An intake of more than 6 mg/d of fluoride results in multidimensional health manifestations, the most common being dental and skeletal fluorosis [1, 3].

Various processes tried so far for the removal of excess fluoride from water are adsorption [3] ion exchange [4], precipitation [5] and electrochemical process [6]. Adsorption is the process considered to be one of the most efficient methods to defluoridate the water. Among the different adsorbents available, activated carbon synthesized from different sources [7 - 23] is one of the most

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