

**catalysts****Ms. Ref. No.: catalysts-1584262****Title: Bio-stimulated adsorption of Cr(VI) from aqueous solution by Groundnut Shell Activated Carbon@Al embedded material****Response to Reviewer-1 Comments**

We appreciate the efforts of the reviewers for their detailed and insightful comments, which have helped us to improve the quality of our manuscript. A point-by-point response to the reviewer-1 comments is appended below for your convenience.

**Comment 1:** Some FT-IR peaks shift with adsorption of Cr, and some not. Please add the discussion which peak shift is related to Cr, the authors can combine these with the discussion of the mechanism.

**Response:** We acknowledge the reviewer's opinion. According to the reviewer suggestion, FT-IR peaks shift related to chromium ion adsorption are discussed in the mechanism section and is incorporated in the revised manuscript. Thank you for your valuable suggestion.

**Comment 2:** The porosity of the sample should be measured.

**Response:** We acknowledge the reviewer's opinion. However, we regret that we were not able to investigate the BET analysis due to pandemic situation, which could definitely give us additional information. We hope the reviewer understand the experimental deficiencies at the stage of the present experiments. We deeply appreciate the comment raised by the reviewer. Thank you very much.

**Comment 3:** It is better to show the SEM images using the same scale. The magnified images can be shown separately or as inset.

**Response:** We acknowledge the reviewer's opinion. According to the reviewer suggestion, the SEM images with same scale are provided in the revised manuscript. Thank you for your valuable suggestion.

**Comment 4:** In Figure 3, what is the origin of the increase concentration of Al and S?

**Response:** We acknowledge the reviewer's opinion. EDX analysis (In Figure 3) – is a conditional type of analysis of the chemical composition of the surface. In EDX, often, spectra with different atomic abundances of elements can be obtained even from the same sample. Thank you for your valuable suggestion.

**Comment 5:** In the experiment,  $\text{H}_2\text{SO}_4$  is added in the first step, what is the purpose? Will this bring pollution problem?

**Response:** We acknowledge the reviewer's opinion. The sulphuric acid disintegrated the leaves. Most of the substances in the leaves are reduced to carbon after two hours. Charring takes place by adding sulphuric acid and by the action of heat, charring removes hydrogen and oxygen from the solid, so that the remaining char is composed primarily of carbon. It also helps to remove the moist content in the leaves. The pollution problem may not be takes place. Thank you for your valuable suggestion.

**Comment 6:** How about the Cr concentration in the polluted ground water? Is the products suitable for this real condition?

**Response:** We acknowledge the reviewer's opinion. Chromium is a potentially toxic metal occurring in water and groundwater as a result of natural and anthropogenic sources. The prepared adsorbent is well suitable in the real condition. Since the prepared adsorbent (Al-GNSC) is successfully reduces the chromium (VI) ion form the real groundwater samples. Thank you for your valuable suggestion.

**The authors are very thankful to the Reviewer for their valuable suggestions for the improvement of the manuscript.**

**All the modifications are shown in yellow color in the revised manuscript.**

With regards

**Ravindranadh Koutavarapu, Ph.D.**