



SDI Review Form 1.6

Journal Name:	International Research Journal of Pure and Applied Chemistry
Manuscript Number:	Ms_IRJPAC_21856
Title of the Manuscript:	Effective Removal of Chromium(VI) Ions from Tannery Effluent Using Chitosan-Alumina Composite
Type of the Article	Original Research Article

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	The authors should provide more references that highlight the use of chitosan as a base for absorbing heavy metal ions, particularly chitosan/ceramic alumina composites, e.g., Adsorption of dyes and heavy metal ions by chitosan composites: A review W.S. Wan Ngah, L.C. Teong, and M.A.K.M. Hanafiah, Carbohydrate Polymers, Volume 83, Issue 4, 1 February 2011, Pages 1446–1456. The authors should explain how their biocomposite absorbs heavy metal ions. The manuscript is notably lacking in the mechanism behind the absorption process. The authors should be consistent with the use of the term Cr(VI) throughout the manuscript, rather than use it interchangeably with Cr and chromium. Section 2.2 – what was the yield of the various processes? Line 76 – where did the ‘oxalic acid treated alumina’ come from? Line 95 – the equation for DA(%) needs to be referenced. Line 152 – the authors refer to C₃ –OH and C₆ –OH	Two new reference added (4&5) as reviewer suggested and whole reference number been rearranged Agreed with reviewer and New section added 3.11 naming Mechanism of Cr(VI) Removal describing the mechanism. As suggested, throughout the manuscript Cr(VI) term used. As suggested, % yield added in section 2.2 Oxalic acid purchase added in materials section and reason for adding oxalic acid was already described. Equation referenced as suggested. Part of FTIR writings removed and new lines were added which require no longer C₃ –OH and



SDI Review Form 1.6

	without providing the structure for chitosan. Please provide a structure with the appropriate carbons marked in it. All the figures in the text are marked as 0X – the 0 is redundant and needs to be removed. Figures 1, 2 and 5 are low in resolution and should be replaced with improved versions. Line 209 – what acid was used to vary the pH from 1 to 6? What was the initial pH? Line 212 – The statement says pH greater than 6 but the data in Fig 4 only goes up to pH 6. Line 214 – refers to Fig 6 but actually refers to Fig 4. Fig 4 – why is the removal efficiency highest at pH 2? From the explanation provided by the authors, the removal efficiency should be higher at pH 1 than pH 2. Lines 221 – 223 – The reference mentioned in this sentence refers to Cr(VI) being reduced to Cr(III). This is the only place in the manuscript that discusses a reduction of Cr(VI) upon absorption on to a composite. Does this happen in the authors' system also? Lines 223 – 225 – what is the rationale behind this statement made by the authors? It should either be supported with data or a reference.	C₆ –OH structure based writings. O from every figure has been removed and new clear figures has been added for figure 1,2,5. Types of materials added which were used to adjust pH. As data clearly shows decrease in efficiency with increase in pH, so pH greater than 6 lines are now removed. Line removed as its now mentioned earlier. As suggested, reasons given why at pH 1 removal efficiency was not higher. Reference mentioned “chitosan biomass after contact with Cr(VI) at pH around 5, about 55% of Cr(VI) gets reduced to Cr(III)”. As shown in our experiment was conducted below pH 5.0 and efficiency was good, it is a possibility that reduction of Cr(VI) to Cr(III) may happen and a reaction is also given. Lines removed as it seems redundant.
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	Line 235 – states the solution pH was ‘kept optimum’; it seems the authors used a pH of 2. Regardless, the authors should state the system pH. Line 237 – the authors studied contact time from 30 to 240 min but not beyond. From this data, it is incorrect to state the optimum contact time was 240 min. Figs 5 & 6 – the legends are unnecessary and need not be removed. Line 249 – instead of stating that the other parameters were kept constant, the authors should specify their values. Line 260 – the authors’ values do not seem to match with Fig 6. Around 10%, the graph suggests a value slightly over 60% and at 25%, the value is probably around 90%. It would be better if the authors showed the values at each data point on the figure. Lines 262 – 263 – what is the saturation point of Cr(VI) ions for the composite? That value should be a constant regardless of the time, dosage or initial concentration of the Cr(VI) solution. Fig 7 – how long was the test conducted to obtain the data generated for this figure? Remove the legend from this figure also. This graph suggests that removal efficiency would improve if a number of composites were set up in series as the decreasing concentration of Cr(VI) in the effluent at each successive step should result in the greatest Cr(VI) removal. Have the authors tested this concept?	pH mentioned as suggested and initial pH also included in the text. Agreed with the reviewer but 240 min (4hr) looks sufficient as contact time, cause ~90% removal efficiency was already achieved. Legends removed. As suggested, values specified now. As suggested, description are now corrected and matched with figure. Agreed with revier, but as all the experiments were performed to find the maximum sorption capacity maintaining the pH, time, dosage hence saturation point should be near our final optimum conditions. Contact time is added and removed legend as suggested. Thanks to reviewer for insightful concept. It was not tested as this test is only about the primary concentration in which adsorbent becomes saturated. Agreed with reviewer that if the test would have done it also showed great removal, but the test would be quite like dosage test.
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	Line 290 – the Freundlich constant is K_F and its units are $(\text{mg/g})(\text{L/mg})^{1/n}$. $1/n$ is dimensionless. Line 304 – Delete ‘From Fig 08, it is evident that’ since the rest of the statement is not derived from the figure. Line 317 – what is the rationale for saying that the adsorption system is favourable? Line 323 – Why was this study conducted at pH 7 while the chitosan study was done at pH 2?	Line corrected as suggested. Line deleted as suggested. Reference added supporting the statement. In order to test the absorbent efficiency of materials at normal condition it was conducted at pH 7, pH adjustment for maximum removal would have increased as same ratio for all the adsorbents. However 10 times less chitosan needed for composite making for removing Cr(VI) with increased efficiency.
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<u>Minor</u> REVISION comments	The paper is replete with grammar and punctuation mistakes that are too numerous to be mentioned individually. The authors are requested to address all of them, e.g., line 20 – persistent, line 31, add hyphen between N and acetyl, line 32 – add hyphen between D and glucose, line 40 – replace with by as described, line 45 – delete are and replace which with that, line 46 – replace which with and, line 58 – replace labor chemikalein with Laborchemikalein, replace hydrochloric acid with HCl, sodium hydroxide with NaOH, use mL instead of ml, line 115 – replace No-40 with No. 40, and so on. Replace ‘Hazaribagh area’ with ‘local’. Readers in general have no idea of where Hazaribagh is. Line 13 – heavy metal contamination is an issue primarily because of their toxicity and secondly because they tend to persist and accumulate.	All corrections made as suggested. As suggested, replaced ‘Hazaribagh area’ with ‘local area’. Line changed as suggested.
<u>Optional/General</u> comments	None	