

Interactive comment on “Clay-biodegradable polymer combination for pollutant removal from water” by M. F. Mohd Amin et al.

Anonymous Referee #2

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Note: Page and line numbers refer to the DWESD formatted manuscript.

Abstract: The abstract should be rewritten to more clearly summarize key findings. What mechanistic and practical insights were obtained as part of this study?

Introduction: The focus on wastewater treatment in the introduction is misleading. Atrazine enters surface water primarily through non-point source contributions, i.e. agricultural runoff.

Page 3, Line 25-27: Explain what is meant by “diffuse zone” and how it aids micro-pollutant removal.

Page 3-4: Explain the mechanism by which clays such as smectite acts as a coagulant aid. How does its cation exchange capacity help? Isn't a major role of clay to serve as

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a weighting agent that aids floc settleability?

Page 5, line 9: Use removal instead of reduction. Comment applies throughout, including figure captions and axis labels.

Section 2.2: Simply state the experimental conditions without providing reasons. Otherwise, I wonder why equilibrium was important for ATT but not SME. Or I can question whether the mixing regime did indeed produce smaller flocs with a higher surface area and whether these factors matter for atrazine removal.

Section 2.3: This section is quite confusing. In the second line, it is stated that no atrazine was added, but the heading and the paragraph before equation 1 mention atrazine removal. Clay dosages of 0-100 mg/L were tested but Figure 2 is based on clay dosages of 0-40 mg/L. And what is the need for showing Figure 2? I would expect that the relationship between turbidity and non-coagulated clay is different than the one between turbidity and coagulated clay. Also, in the second paragraph, different settling periods are mentioned when in the paragraph above a settling time of 20 minutes is specified.

Section 2.3: Paragraph before equation 1. This paragraph is difficult to defend given that it is claimed in section 2.2 that CS enhanced atrazine removal. Why wasn't atrazine added and atrazine removal measured in the jar tests?

Section 3.1: Explain why a negative to neutral surface charge of ATT supports findings of low atrazine removal. Atrazine is a neutral molecule, so its adsorption should not be affected by surface charge or low CEC. Overall, the results shown in Figure 3 should be described in a more mechanistic manner.

Section 3.2: The diffuse zone and its role in removing atrazine should be described more clearly.

Section 3.3: Are any of the atrazine removal results based on measurements or calculated? See comments related to section 2.3. Also, why is it important to distinguish

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between the amount of settled and suspended atrazine. Presumably, the suspension would undergo filtration after sedimentation such that essentially all of the suspended fraction is removed.

Figure 4: Is the increase in atrazine removal after CS addition to SME statistically significant. Were experiments conducted in replicate? Show error bars?

Figure 5: Results of this experiment suggest that clay properties are only one aspect controlling atrazine removal. The 10 mg/L ATT combination with 20 mg/L CS worked about as well as the evaluated SME combinations shown in Figure 4. What insights from Mohd Amin et al. (2014a) can be used here to explain the results? And are there new insights gained here from combining clay with CS?

Figure 6: Y-axis label is misleading because atrazine in solution is not removed. Also, are the atrazine removal results based on measurements or all calculated?

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