

# Review of: "Adsorption behaviors and mechanisms of $\text{Cu}^{2+}$ , $\text{Zn}^{2+}$ and $\text{Pb}^{2+}$ by magnetically modified lignite"

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In this paper, an environment-friendly and efficient magnetic modified lignite adsorbent was developed to remove heavy metal ions from acid mine wastewater. The effects of pH value, adsorbent dosage, temperature, initial concentration of heavy metal ions and contact time on the adsorption effect of adsorbent were discussed. The experiments of scanning electron microscope (SEM), X-ray diffraction (XRD), Fourier transform infrared spectroscopy adsorption isotherm model and adsorption kinetics model were carried out. After reading, I think this article is innovative. However, there are some problems in grammar, experiment and experimental pictures, mainly including the following aspects:

1□ Abstract: Its better to include max adsorption capacity besides max removal rate.

2□ There is less discussion about the adsorption in general, as well as useful of magnetic properties.

3□ In general, introduction should follow the state of the art of this field and review what has been done, for supporting the research gap and the significance of this study. Please improve the state-of-the-art overview, to clearly show the progress beyond the state of the art. The lack of proper justification creates the wrong impression that the authors are unaware of the recent developments. Please use relevant recent references by OTHER authors, recent meaning from 2018 - 2022 (5 years).

4□ Also, the main objective and novelty of this study, should be explicitly stated as a separate paragraph (last) in the introduction.

5□ It is suggested that the author add bet experiment to analyze the change of specific surface area of lignite before and after modification, because it is difficult to observe the change of specific surface area by scanning electron microscope alone.

6□ The experimental analysis of SEM is relatively simple and should be further explored and analyzed. It is suggested to refer to the following two papers:

1□ Weibo Han, Gang Zhou, Danhong Gao, Zhixue Zhang, Zunyi Wei, Hetang Wang, Houqin Yang.

Experimental analysis of the pore structure and fractal characteristics of different metamorphic coal based on mercury intrusion-nitrogen adsorption porosimetry[J]. Powder Technology, 2020, 362: 386-398.

2□ Weibo Han, Gang Zhou, Qingtao Zhang, Hongwei Pan, Dong Liu. Experimental study on modification of physicochemical characteristics of acidified coal by surfactants and ionic liquids[J]. Fuel, 2020, 266: 116966.

□7□Did authors optimize the adsorption parameters? If yes, what is the basis for the optimization of adsorption parameters?

□8□Authors studied the effect of various process parameters that effect the removal efficiency; but I didn't find any study on interactive effects. As individual behavior will be different from the combination.

□9□Discussion of the results should provide useful in-sights. Furthermore, it is advice to compare the result with recent state-of-the-art in result section.

□10□Conclusions must go deeper, it would be more interesting if the authors focus more on the significance of their findings regarding the importance of the interrelationship between the obtained results and sustainable development/cleaner production in the sector context, and the barriers to do it, what would be the consequences, in the real world, in changing the observed situation, what would be the ways, in the real world, to change/improve the observed situation.