Review of: "Adsorption behaviors and mechanisms of Cu2+, Zn2+ and Pb2+ by magnetically modified lignite"

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Potential competing interests: The author(s) declared that no potential competing interests exist.

Di and coworkers described a magnetically modified lignite for adsorption of Cu2+, Zn2+ and Pb2+. Though this manuscript is well-constructed and meaningful, previously researches with the similar topic have been done. Besides, the explanation about the experimental results is doubtful and obscure. It is far away from the requests to publish for Scientific Reports at this status and a major revision should be made, the details are in the following:

1. In Adsorbent preparation, clearly provide the photo of magnetically modified lignite (MML) prepared and lignite. So, list the photo of MML prepared and lignite in the manuscript.

2. Since the particle size and specific surface area of MML play a vital role in the adsorption process, the particle size and specific surface area of MML prepared should be provided.

3. In Adsorption condition optimization experiment, “Prepared a Cu2+ standard solution with a concentration of 30 mg/L. Added a certain amount of lignite and MML into 250 mL conical flasks containing 250 mL Cu2+ standard solution. Placed the conical flasks in a constant tremors shaking at 150 r/min, adsorb for 180 min, and then sample with a pipette gun. The samples were filtered through a 0.45 μm microporous membrane before analysis with AAS.” How did you decide these processing parameters?

4. In FTIR analysis., the peaks in FT-IR spectrum caused by stretching or bending vibration should be clear. For example, the peak at 3400 cm-1, 2920 cm-1 and 1600 cm-1 of MML were attributed to the O–H, -CH2 bonds and carboxylic acid functional groups. Better literature review in this part is requried. Suggest to discuss and cite the following literature, including Separation and Purification Technology, 2022, 282: 119122; International Journal of Mining Science and Technology, 2021, 31: 1145-1152; Journal of Molecular Liquids, 313, 113506.

5. TGA should be carried out to indicate the stability of the Fe3O4-NGO, only FTIR and SEM is not enough.

6. Recycling performance of the MML should be carried out to indicate the recyclability of the MML.