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# *Novel magnetic coffee waste nanocomposite as effective bioadsorbent for Pb(II) removal from aqueous solutions*

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**Highlights**

- A low cost magnetic adsorbent was successfully synthesized from coffee waste by embedding $Fe_3O_4$ nanoparticle.
- Effect of $Fe_3O_4$ loading onto coffee waste was evaluated for Pb (II) removal.
- Adsorption data fitted best with Langmuir model and followed pseudo-second order kinetics indicating chemisorption.
- Maximum monolayer adsorption capacity for Pb (II) at 25˚C was 41.15 mg/g.
- Thermodynamic analysis revealed that sorption is endothermic and spontaneous in nature.
- Oxygen rich surface functional group plays an important role in enhancing the adsorption capacity.