

## Effect of linear alkylbenzene sulfonate (LAS) on the coagulation of ZnO nanoparticles in aqueous matrix

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### ABSTRACT

The widespread use of anionic surfactant linear alkyl sulfonate (LAS) and zinc oxide nanoparticles (nano-ZnO) makes it possible for both compounds to coexist in aquatic environments. Along with the effect of LAS on chemical coagulation, this study shows the importance of LAS on aggregation, sedimentation, zero charge point (ZCP) and removal of nano-ZnO in the coagulation process using tannin and FeCl<sub>3</sub> as primary coagulants. The results showed that at concentrations above 100 mg L<sup>-1</sup>, LAS negatively influenced the aggregation and sedimentation of nano-ZnO. On the other hand, surfactant did not significantly interfere with the ZCP of nano-ZnO, with both coagulants, showing better results when submitted to the pH coagulation process near the obtained ZCP. Increasing the LAS concentration significantly influenced the efficiency of the coagulation process, showing that at concentrations of 300 mg L<sup>-1</sup>, the removal efficiency dropped below 5% at different pH values. In summary, this study may contribute demonstrating that the presence of LAS can alter the behavior of nano-ZnO and significantly reduce the efficiency of the coagulation process.

*Keywords:* Linear sulfonate alkylbenzene; Zinc oxide nanoparticles; Aggregation; Chemical coagulation

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