

Preparation of chitosan-coated Zn-MOF@PDMS nanocomposites sponge for antibacterial activity

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Nanocomposite sponges composed of biocompatible polymers and inorganic materials have attracted much attention within various fields such as biomedicine, pharmaceuticals, and food packaging [1-3]. In this study, we have fabricated some novel nanocomposites with a combination of salt leaching for fabrication of PDMS sponge, *in situ* synthesis of Zn-MOF, and dip coating process for coating Zn-MOF@PDMS sponge with chitosan. Chitosan stabilizes Zn-MOF particles and promotes the biocompatibility of the as-obtained composites. The surface morphology of PDMS and its nanocomposites was investigated by scanning electron microscope (SEM). X-ray diffraction was conducted to study the microstructure of the prepared Chitosan@Zn-MOF@PDMS sponge. The nanocomposite sponge, Chitosan@Zn-MOF@PDMS, was also studied by elemental EDS mapping technique. The antibacterial activity of the as-prepared sponges was also evaluated. Chitosan and Zn-MOF improved the antibacterial properties of the PDMS sponges against *Escherichia coli* and *Staphylococcus aureus*. The Chitosan@Zn-MOF@PDMS sponge has the potential for antibacterial and tissue engineering purposes owing to their biocompatibility, porosity, and good mechanical stability.

Keywords: Metal-organic framework; Polydimethylsiloxane; Biocompatibility

References

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