



Poly(butyl acrylate-co-methacrylic acid) stabilized silver nanoparticles for peroxide prevulcanized natural rubber

Currently, there is an increasing interest and demand for products with antimicrobial properties, especially in medical, food, and household applications. Enhancing the antimicrobial properties of the rubber by incorporating silver nanoparticles adds value to the rubber and widens the rubber applications. However, the addition of silver nanoparticles to rubber is limited due to its adverse impact on the mechanical properties of rubber. Therefore, incorporating stabilizing agents for the nanoparticles in the rubber nanocomposite is essential.

This research involved the synthesis of poly(butyl acrylate-co-methacrylic acid) P(BA-co-MAA) particles with negatively charged surfaces. These particles served as additives to stabilize Ag in peroxide prevulcanized natural rubber/silver nanocomposites. The presence of P(BA-co-MAA) in the nanocomposite films increased tensile strength compared to films without P(BA-co-MAA). The highest enhancement of mechanical properties of the nanocomposites was obtained with 10,000 and 5000 ppm of P(BA-co-MAA) and AgNO₃, respectively. The PPNR-P(BA-co-MAA)/Ag films exhibited a bactericidal effect against *E. coli* and *S. aureus*.

The associated SDG goal is Responsible consumption and production (12).

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Reference:

S. Rattanawongkhae, P. Sunintaboon, P. Sa-nguanthammarong, S. Wirasate "Influence of poly(butyl acrylate-co-methacrylic acid) stabilized silver nanoparticles on mechanical and antibacterial properties of peroxide prevulcanized natural rubber", *Reactive and Functional Polymers* 192 (2023) 105705.

