

# **Air/Water Interface Study of Poly(ethylene glycol) Monostearate Esters and Magnetic Nanoparticles Stabilized with PEG Surfactants**

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## **Abstract**

Natural, saturated fatty acids have a long history as microbicides against many pathogens. In order for microbicides to be effective, there needs to be a method of releasing the drug into the body that will target the pathogen. The integration of nanotechnology products, such as nanoparticles with therapeutic agents, is a growing area of medical research. The focus of this research is to measure the surface pressure-area isotherms of poly(ethylene glycol) (PEG) monostearates. It was found that the isotherms produced by the PEG monostearates showed molar mass dependent behavior. There was a general downward trend in collapse pressure as the chain length of the PEG linker increased. These surfactants also serve as starting materials for synthesizing conjugated fatty acids with variable PEG lengths. Once these molecules have been made they will be used to replace oleic acid on magnetic nanoparticles (MNPs) synthesized with an oleic acid stabilizing layer. Oleic acid stabilized MNPs were successfully synthesized.