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## Synthesis of phospholipid biosurfactants and characterization of interfacial property and environmental compatibility for cosmetic products application

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Interest in biosurfactants has been rapidly increasing in recent years due to their diversity, environmentally friendly nature such as nontoxicity and excellent biodegradability, possibility of large-scale production, selectivity, and high performance efficiency even at severe operation conditions such as high temperature and extreme high or low pH. In this study, phospholipid biosurfactants with excellent biodegradable characteristics were synthesized from renewable vegetable oils such as sunflower oil, rapeseed oil, cottonseed oil, palm oil, and coconut oil for cosmetic products application and the structure of the resulting products was elucidated by FT-IR, <sup>1</sup>H NMR, and <sup>13</sup>C NMR spectroscopies. The synthesized phospholipid biosurfactants have been found to be highly surface-active and very effective in reducing interfacial free energy from interfacial property measurement such as CMC, static and dynamic surface tensions, emulsification activity, wetting property and foam property. Acute oral toxicity (LD50) evaluation indicated that the synthesized phospholipid biosurfactants are nontoxic and the primary biodegradability has been found to be 99%, indicating readily biodegradable. Acute dermal irritation test showed that the synthesized biosurfactants are free of a dermal irritation problem and very mild. It has been also observed from acute eye irritation test that the synthesized biosurfactants do not cause an eye irritation problem. The newly synthesized phospholipid biosurfactants can be potentially used in cosmetic products application since they are highly surface-active, very effective in lowering interfacial free energy, nontoxic, non-irritating, very mild, and readily biodegradable.

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