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Valorisation of waste chicken feathers: Green oil sorbent

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#### ABSTRACT:

The threat of oil pollution increases with the development of large-scale offshore petroleum industrial activities. Recently, reducing waste materials through reuse has contributed to sustainable manufacturing in many industries. With development of large-scale poultry farming industries, the disposal of large amounts of waste chicken feathers has become a huge problem. Thus, sustainable methods for valorisation of this waste are needed. This paper examines beneficiation of waste chicken feathers via conversion into sorbents for clean-up of oil spills in water bodies to replace conventionally used synthetic adsorbents that are costly. Chicken feathers have a very high capacity for adsorption of liquid oils (up to 16.21 g of oil/g of chicken feather) at fast uptake time (10 min). The removal efficiency of oils in spills increases with increment in contact time with the sorbent. Untreated waste chicken feathers exhibited slow sorption rate for oil due to the presence of grease and other impurities on the surface of feathers. More than 85% of the oil adsorbed by chicken feathers can be recovered. Thus, waste chicken feathers show very attractive and promising adsorption/absorption properties for oil spill clean-up applications to replace polymer-based adsorbents due to their high oil absorption capacities. Both untreated and treated chicken feathers show promising potential for use as oil absorbents.