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Surface morphology and adhered substances of microplastics from the coastal beaches in China

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Microplastics refer to small pieces (<5 mm) of plastics and are considered as an emerging pollutant of concern worldwide in coastal and ocean environment. This is because ingestion of microplastics and transfer in the trophic levels may pose adverse effects on marine organisms which accumulate plastic pollutants, monomers and additives. In this paper, we introduced in particular surface morphology and substances on the sediment microplastics in different shape types such as foam, particle, pellet, fiber and fragment. The microplastic debris in the sediment was separated by a continuous flow and air floating/density separation apparatus. Spectroscopic approaches including FT-IR and SEM were used for the microplastics identification coupling with pretreatments using several chemicals. The technique of attenuated total reflectance FT-IR (ATR-FT-IR) was used to identify chemical components of the microplastics from the samples. Scanning electron microscope equipped with an energy dispersive spectrometer (SEM-EDS) was applied for observation of surface morphology of the microplastics and for identification of the inorganic substance absorbed onto the surface. The observation showed that the microplastics surfaces were irregular, rough, hollow and porous, indicating severely weathered and eroded. Some microplastics surfaces had iron oxides and the others had crude oil and likely organisms, implying that the field microplastics could be rather complicated and provide highly adsorptive carriers adhering toxic pollutants and harmful to living biotas in coastal environment. The paper also puts forward an insight on future research needs on microplastics in ocean and coastal zones in China.

Biography

Qian Zhou is studying for MSc in Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, majoring Coastal Environmental Science and Engineering. She has published 2 papers in *Chinese Science Bulletin* and applied for 1 patent and has been studying microplastics pollution in the coastal zones in China.

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