1 Towards more realistic reference microplastics and nanoplastics:

2 **Preparation of polyethylene micro/nanoparticles with biosurfactant**

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8 Supplementary Information

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11 **DSC measurements**

12 The crystalline fraction of the gelled PE was determined by taking the ratio between the 13 enthalpy of fusion of PE at 116° C and the enthalpy of fusion of 100% crystalline PE (285 14 J/g)¹⁵. The estimated crystalline fraction in the gelled PE was 32%.



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16 Figure.S1. Shows the DSC thermogram of gelled PE obtained by dissolving the PE in toluene
17 by heating at 90°C for overnight and subsequent rapid cooling to 20°C followed by drying of
18 the toluene. Peak in the gelled PE is an indication of crystalline domains in the gelled PE.



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Figure.S2. (a) Derivative of the weight loss of the powder as a function of temperature for
different concentrations of(a) Tween 60, (b) biosurfactant, and (c)Tween 80. The powder was
obtained with 10 wt% PE in the toluene phase. The data is compared with the PE pellets (PE)
and 100% Tween (Tween80,).



36 Figure S4 CLSM images of particles formed with different PE concentrations at2 wt% Tween





39 Figure S5. Weight concentration distribution of the particle radii with different concentrations

40 of PE at 2 wt% Tween 60.

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