Supporting Information

Nanoplastic sizes and numbers: quantification by single particle tracking

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Figure S1. DLS autocorrelation curves obtained for PS beads (thin lines) with nominal diameters of 400 nm (red), 200 nm (green), 100 nm (blue) and 40 nm (orange). Single exponential fits (broad lines below) to the autocorrelation curves gave bead diameters of 470 nm, 215 nm, 110 nm and 45 nm.



Figure S2. Size distributions obtained from simulated bead trajectories. With increasing trajectory length (in n steps) the obtained distribution narrows and changes from approximately log-normal to normal.



Figure S3. Size distribution of a PS particle suspension obtained by grinding a disposable PS cup. Characterization of the PS particle size distribution based on SPT experiments, only trajectories with n>16 are taken into account. Using only longer trajectories did not remove the tail in the size distribution which shows that larger particles are indeed present in the sample.



Figure S4. a) DLS autocorrelation curves obtained for a PS particle suspension obtained by grinding a disposable PS cup (thin line). A single exponential fit (broad line below) to the autocorrelation curves gave a bead diameter of 199 nm. **b)** Scanning electron microscopy image of the PS particles dried on a surface. Scale bar 500 nm. The plastic particles are clearly visible as roughly spherical particles of approximately 100 nm. Smaller, irregular structures are also visible which we assign to be drying artefacts.



Figure S5. a) Wide field image of NileRed stained nanoparticles that leaked into hot water from a disposable PS plastic cup. nanoparticles are visible as fluorescent spots of varying intensity. Both bright fluorescent spots originating from particles in the focal plane and contributions from out of plane fluorescence are visible. We find an average of approximately 28 particles per frame, which gives a concentration of ~10⁹ particles/ml. b) Size distribution obtained for the leaked nanoparticles determined using SPT. The cumulative histogram is shown in red. Note, particle sizes were limited to < 1 um by filtration. c) Raman spectrum obtained for a piece of the disposable PS cup (black) and the Raman spectrum of the approximately 1000 times concentrated leaked particle suspension dried in on the surface of a glass slide. Raman spectra obtained from the control sample did not show any distinct Raman peaks.