Supporting information: Quantitation of polystyrene by pyrolysis-GC-MS: the impact of polymer standards on micro and nanoplastic analysis

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Table S1
The retention time (RT, minutes), quantifier (Q1) and qualifier ions (Q2, Q3) for the major pyrolysis products of polystyrene.

Indicator compound	**RT (min)**	***m/z* (Q1)**	***m/z* (Q2)**	***m/z* (Q3)**
Styrene	4.49	104	103	78
α-Methylstyrene	5.42	118	117	103
3-Butene-1,3-diyldibenzene (styrene dimer)	10.62	91	130	208
5-Hexene-1,3,5-triyltribenzene (styrene trimer)	14.26	91	117	194

Table S2
The percentage accuracy (%) and standard deviation (n=3) from the individual PS standards calculated using 5-Hexene-1,3,5-triyltribenzene ($C_{24}H_{24}$), the styrene trimer, with a polymer mixture (Polymix B) comprising PP, PE, PVC, PMMA, PET, and PS-MERCK as the reference PS standard.

Amount	**0.1 µg**	**0.5 µg**	**1.0 µg**	**2.0 µg**		
	Accuracy (%)				**Average (%)**	**Stdev**
PS-Cospheric	23	9	5	8	11	8
PS-MERCK	117	88	78	77	90	19
PS-P4279	135	111	103	69	105	27
PS-P42569	124	119	74	73	97	28
PS-P5138	133	92	84	62	93	30
PS-P4288A	81	83	86	89	85	4
PS-P40567	95	113	64	61	83	25
PS-P938-SBdT	69	94	69	50	71	18
PS-P2270	128	49	54	70	75	36
PS-P1099H	84	58	39	36	54	22

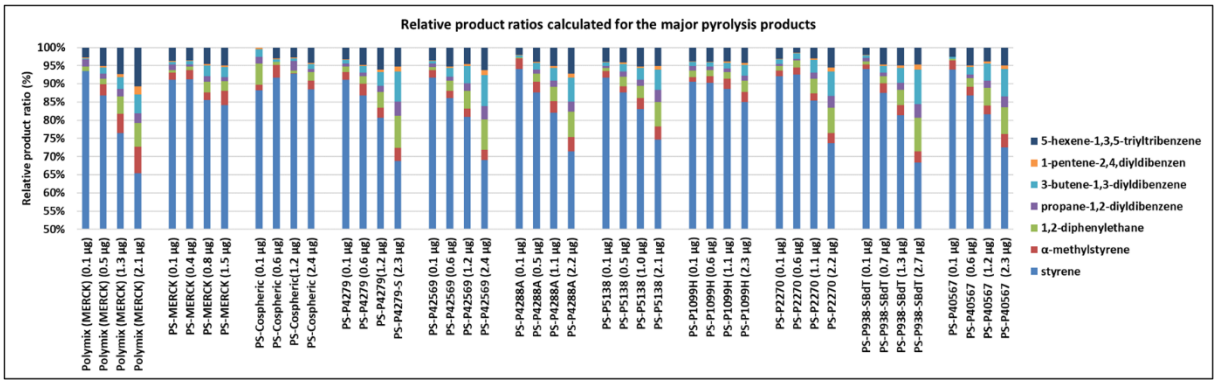

Fig. S1. The relative pyrolysis product ratios for Polymix B, and ten individual PS standards based on the major pyrolysis products. The area obtained for each marker was corrected by the mass of PS to give the corrected mass of polymer injected in each analysis.

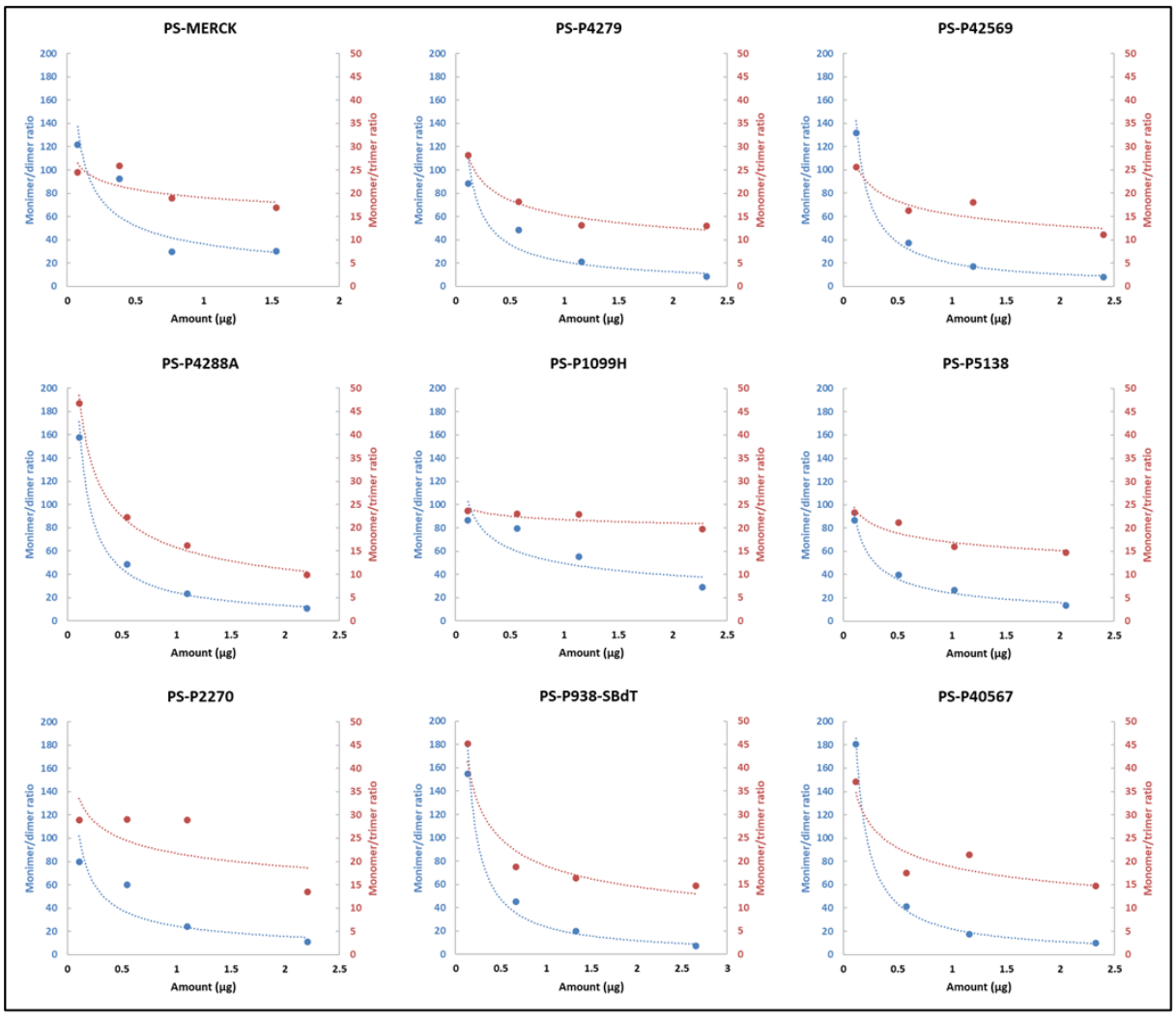

Fig. S2. Sample amount dependence of the monomer/dimer ratio (blue) and monomer/trimer ratio (red) from the individual polystyrene standards.

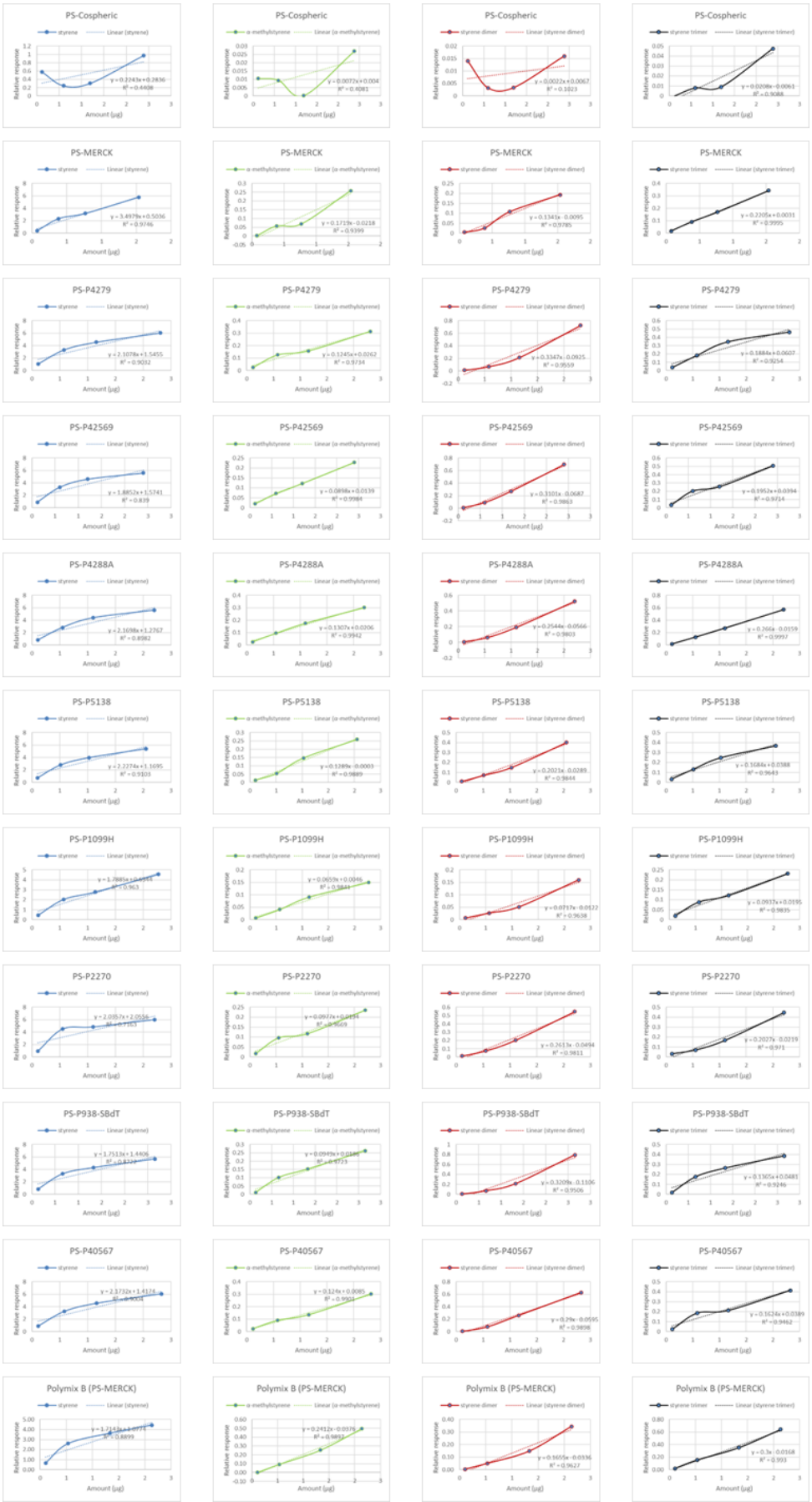

Fig. S3. The calibration curves along with regression coefficient for styrene, α-methylstyrene, 3-butene-1,3-diyldibenzene (styrene dimer), and 5-hexene-1,3,5-triyltribenzene (styrene trimer).