



# Structural design, preparation and characterization of light, isotropic and robust statically determined organic frameworks as reusable adsorbents

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**Abstract:** Using (bi)adamantane "knots" and *p*-phenylene "rods" as building blocks, statically determined organic frameworks, viewed and termed as porous organic polymers (POP) were synthesized by Suzuki coupling polycondensation with high yields, 85~94%. The saturation of the polymer linking knot and rod groups was determined by FT-IR and <sup>13</sup>C NMR spectroscopy. The POP material particles were light in weight (volumetric density of 0.1~0.24 g cm<sup>-3</sup>), porous (total pore volume of >0.35 cm<sup>3</sup> g<sup>-1</sup>), and spherical in shape. The obtained POP materials were highly stable in its structural integrity, demonstrating both exceptional thermal stability upon heating at high temperatures and excellent chemical resistance to strong acid and base. In addition, X-ray scattering data indicated that the POP structures were amorphous in

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