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Control and expression of $-NH_2$, $-SH$, $-COOH$ and SiO_2 on the surface of silicon carbide quantum dots MUNUVE MWANIA, SUSANA AGUIRRE-MEDEL, PETER KROLL, None — We present simple protocols for reliably tailoring the surfaces of *zinc blende* silicon carbide quantum dots (β-SiC QDs). The SiC QDs are synthesized via photo-assisted electrochemical corrosion of bulk powders at different temperatures and time scales. After washing the residual acid and resuspending in H_2O, the surfaces of SiC QDs were controllably coated with four different functional groups, specifically $-NH_2$, $-SH$, and $-COOH$ and $-SiO_2$. We began by covalently attaching primary amines ($-NH_2$) to the QD surface. The amine terminations were then converted to amine/thiolate ($-NH_2/SH$) and amine/carboxylate ($-NH_2/COOH$) functional groups. SiO_2 shells around SiC QDs (*to create $SiC@SiO_2$ nano-structures*) were grown using a TEOS-mediated Stöber method. The presence of amine and thiol groups was confirmed by fluoresceamine assay test, X-ray photoelectron spectroscopy (XPS) and infrared spectroscopy (FTIR). While a negative fluoresceamine assay test confirmed the replacement of amine groups by thiol groups, the thiolation of the surface was also confirmed through Ellman's assay, XPS and FTIR. The presence of the SiO_2 shells was examined using transmission electron microscopy and XPS. Our results open up possibilities to manipulate SiC QDs for various applications.

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None

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