CHEMISTRY
A EUROPEAN JOURNAL

Supporting Information

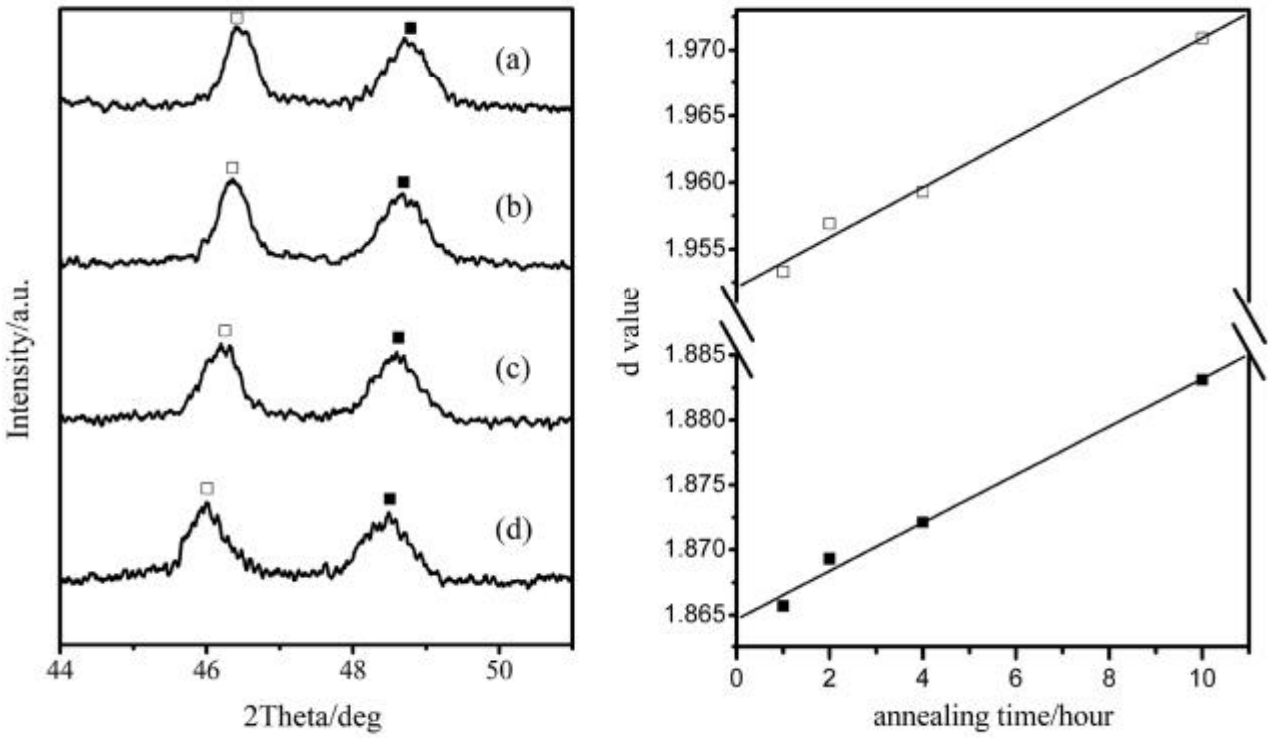
The Structure-Controlling Solventless Syntheses of Uniform Cu_2S Nanodisks and their Optical Properties

Yu-Biao Chen, Ling Chen, Li-Ming Wu*

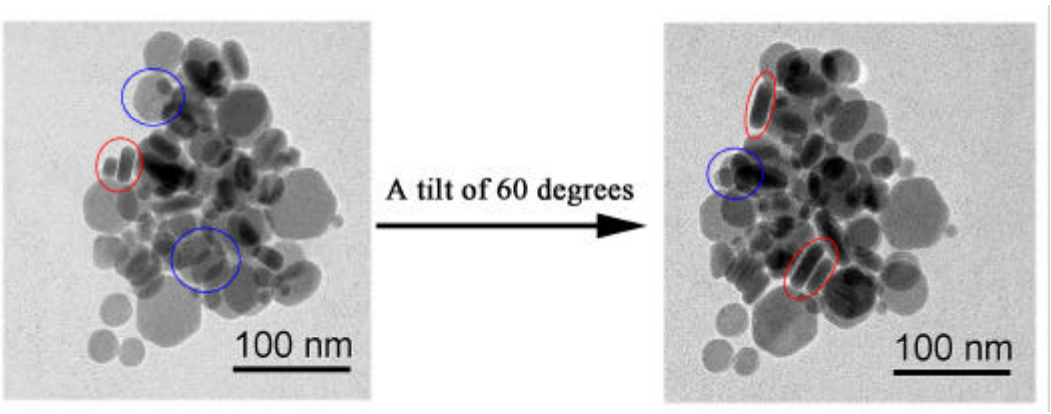
State Key Laboratory of Structural Chemistry, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, Fujian 350002, P.R. China

STable 1. Observed Interlayer Spacing (*kd* Å) from the Pronounced (0*k0*) Reflections of As-synthesized $Cu(SC_{12}H_{25})_2$ Precursor

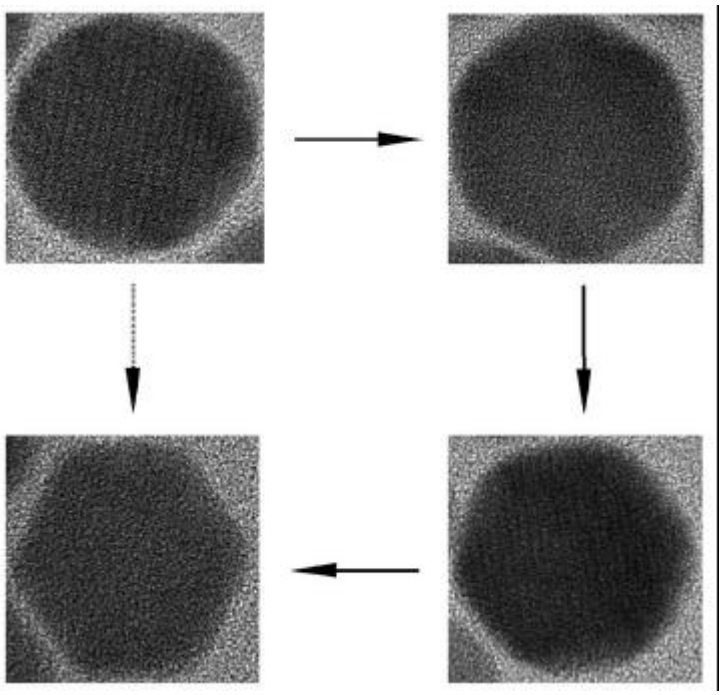
d_{obs} (Å)	*k*	*kd* (Å)
17.8429	2	35.6858
11.9361	3	35.8083
8.9698	4	35.8792
7.1618	5	35.8090
5.9795	6	35.8770
5.1219	7	35.8533
4.4587	8	35.6696
3.9929	9	35.9361



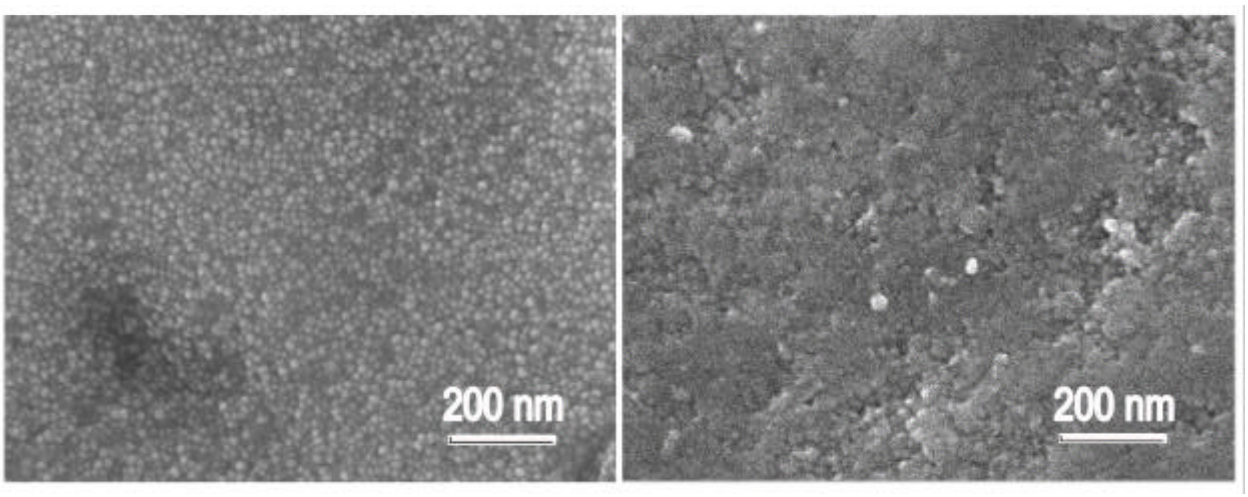
SFigure 1. The enlargement of Figure 4 (left), and the *d* value-anneal time-dependence plots(right).



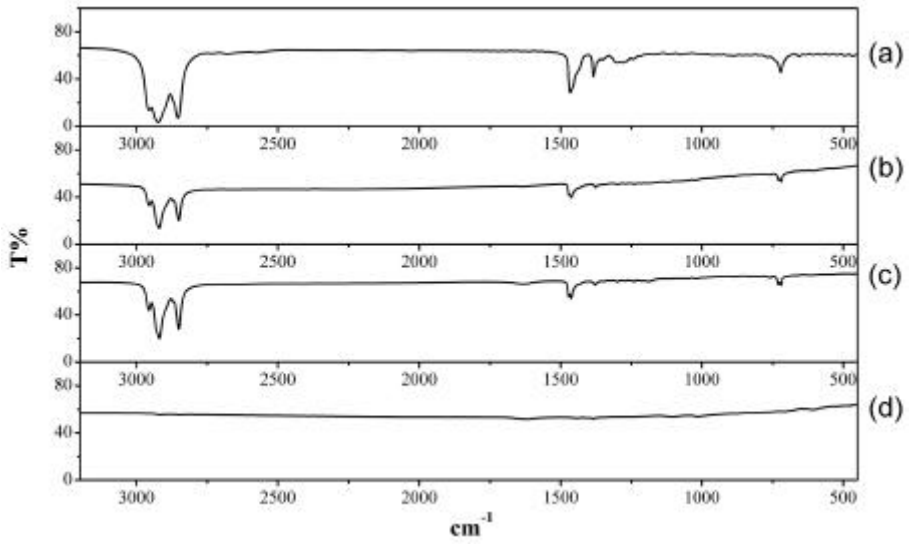
SFigure 2. The tilted TEM images of Cu_2S nanodisks. Blue circles represent the nanodisks lying flat on the substrate; red ellipse represent the standing nanodisks.



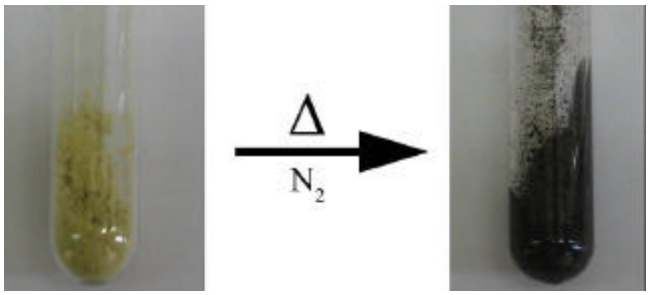
SFigure 3. Some samples showing the gradually development of round nanodisks into faceted nanodisks with six-fold symmetry.



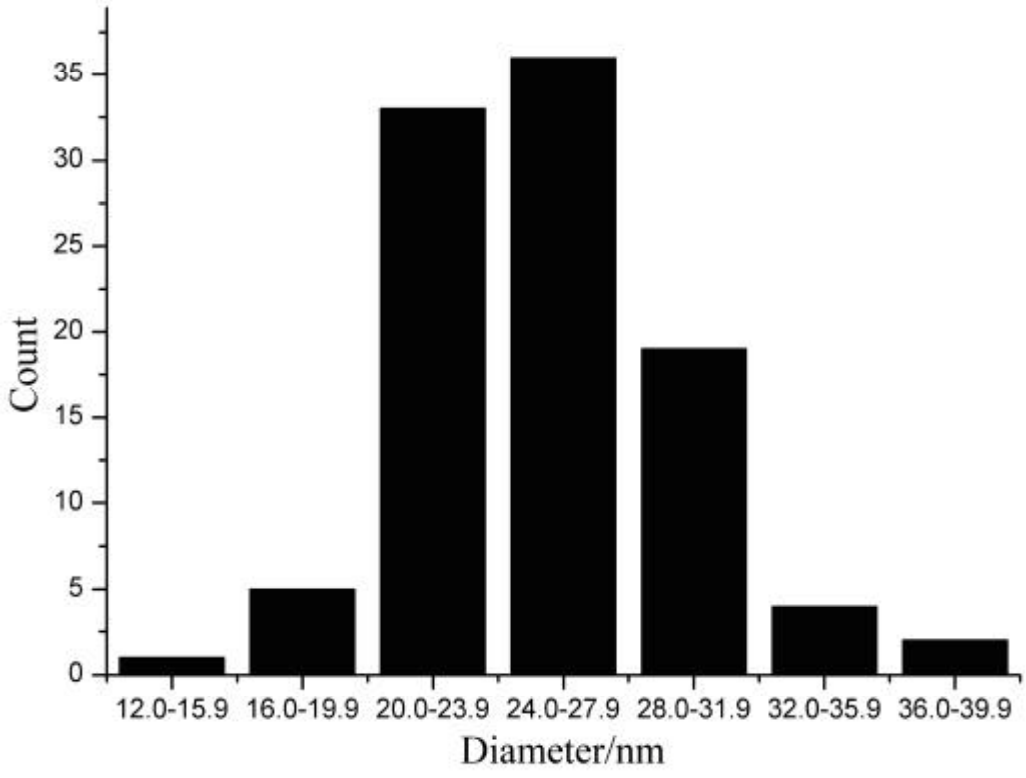
SFigure 4. SEM images of Cu_2S nanodisks (left) and their sinters (right) that are obtained by re-anneal under N_2 flow at 220 °C for 2 hours.



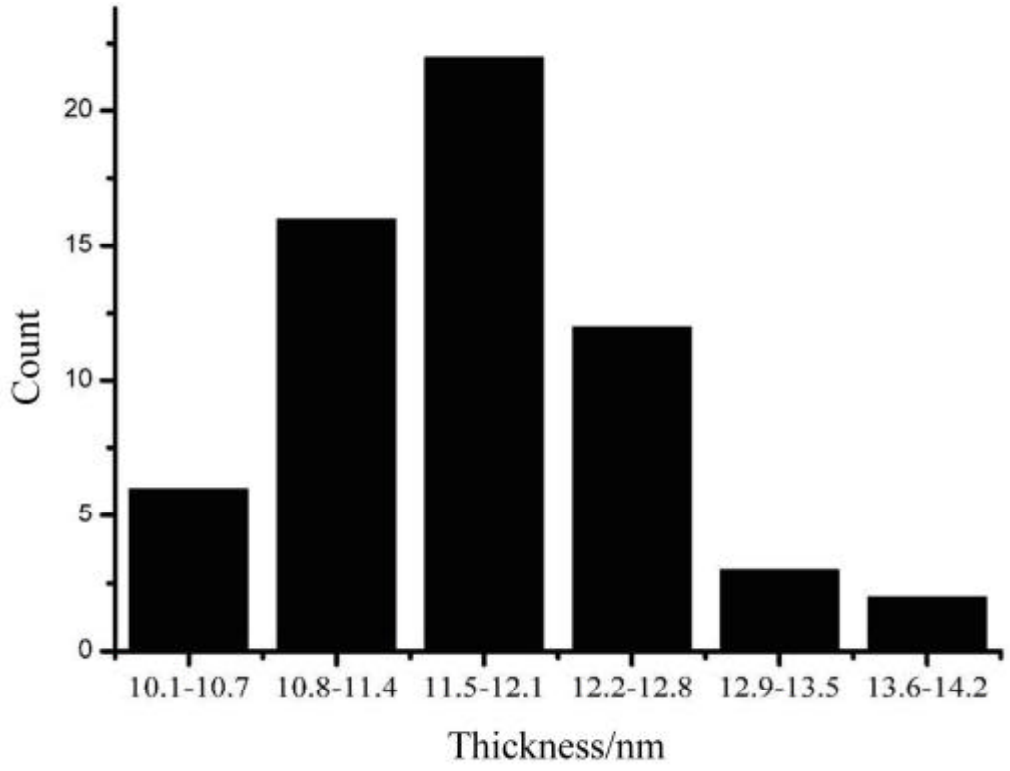
SFigure 5. The FTIR spectra of (a) 1-dodecanethiol and the products by heating $Cu(SC_{12}H_{25})_2$ precursor at 220 ℃ for (b) 2 hours and (c) 10 hours and (d) after washing the product in (b) with dichloromethane to remove organic byproducts.



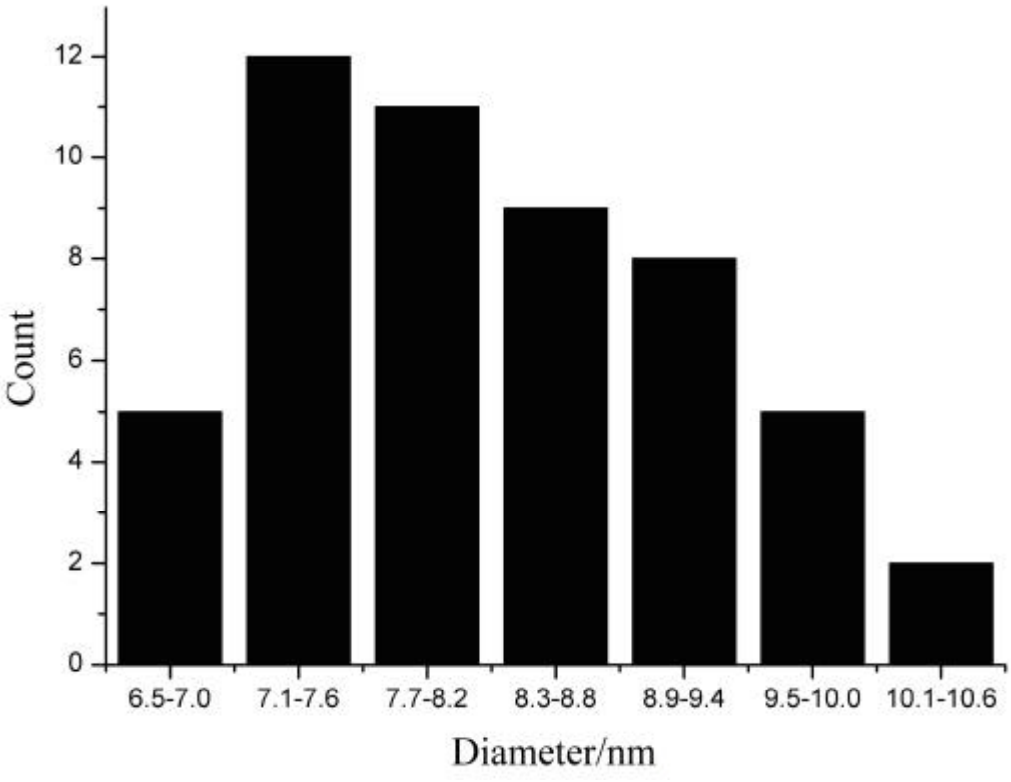
SFigure 6. The yellow-green precursor (left) turns black (right) by heat treatment at N_2 atmosphere.



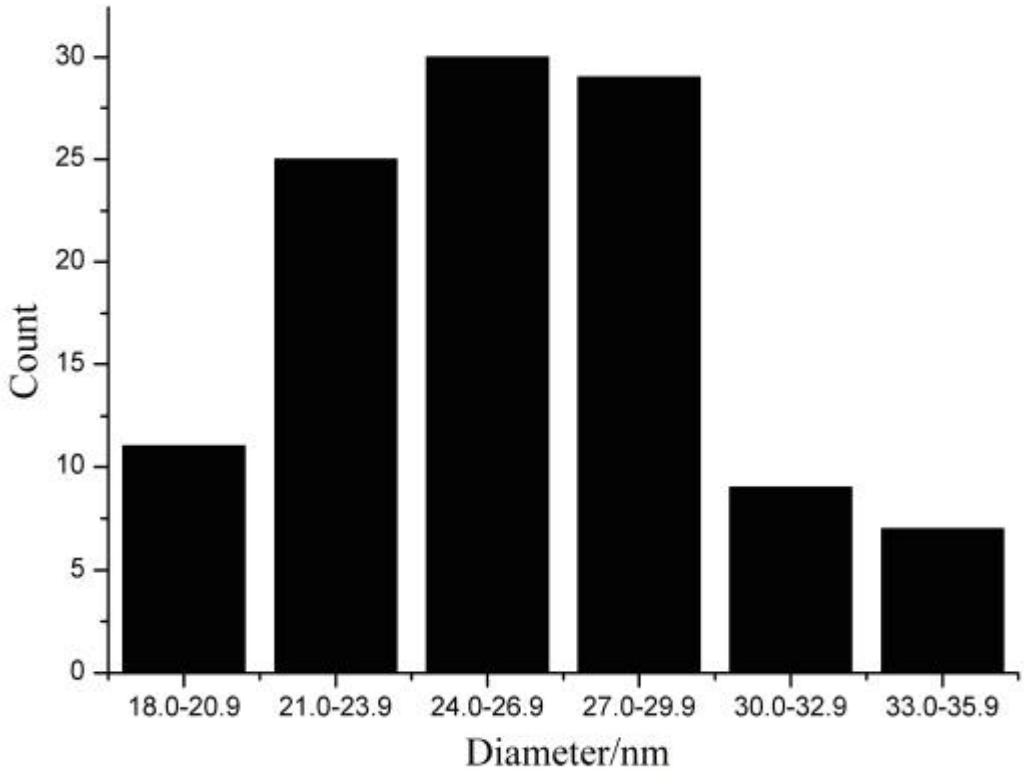
SFigure 7. Diameter distributions for Cu_2S nanodisks produced at 200 °C for 10 hours; the average diameter is ~25.2 nm (s = ±16.7%).



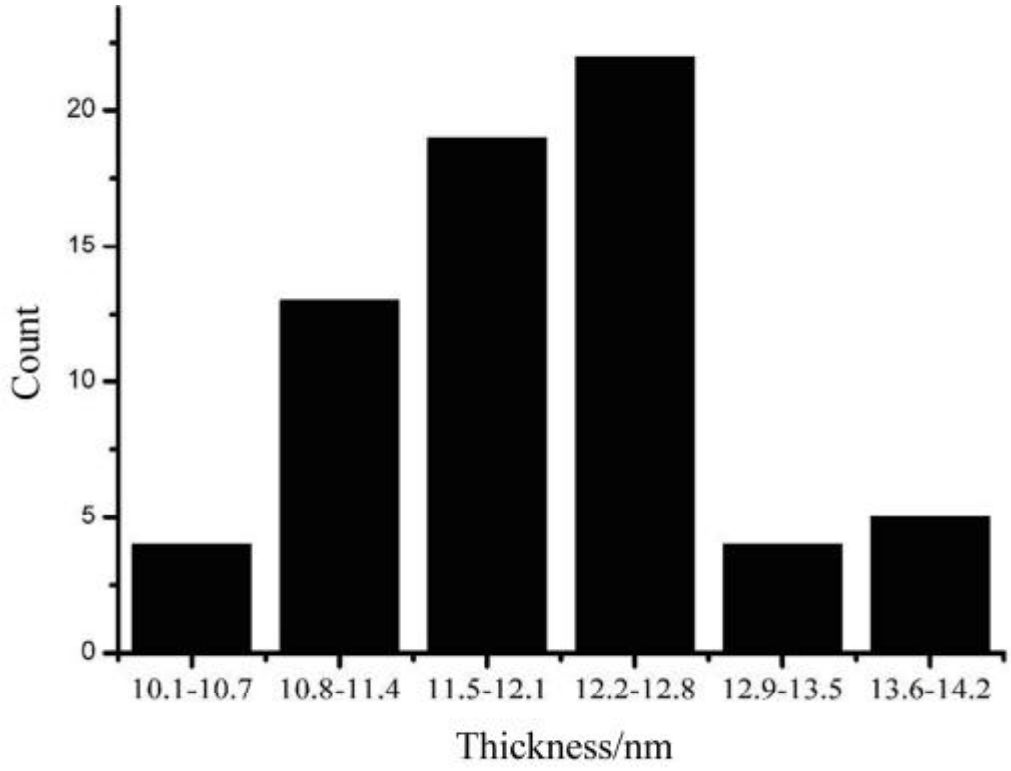
SFigure 8. Thickness distributions for Cu_2S nanodisks produced at 200 °C for 10 hours; the average thickness is ~11.8 nm (s = ±7.3%).



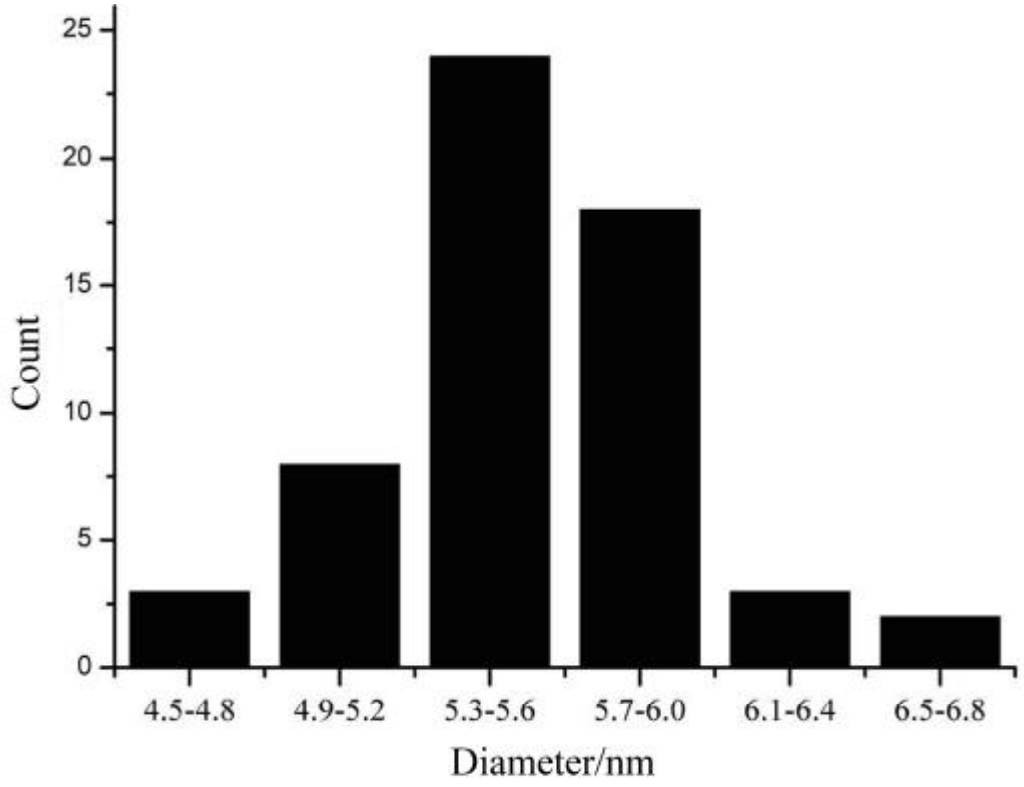
SFigure 9. Diameter distributions for Cu_2S nanodisks produced at 210 °C for 2 hours; the average diameter is ~8.3 nm (s = ±11.8%).



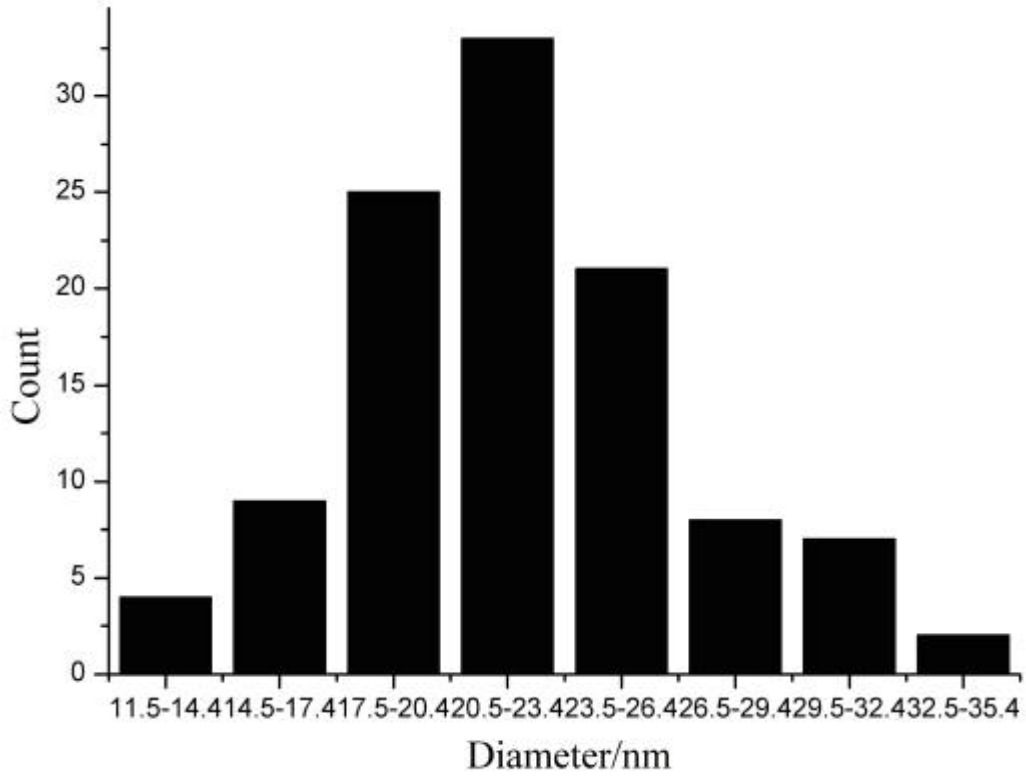
SFigure 10. Diameter distributions for Cu_2S nanodisks produced at 210 °C for 10 hours; the average diameter is ~25.8 nm (s = ±15.3%).



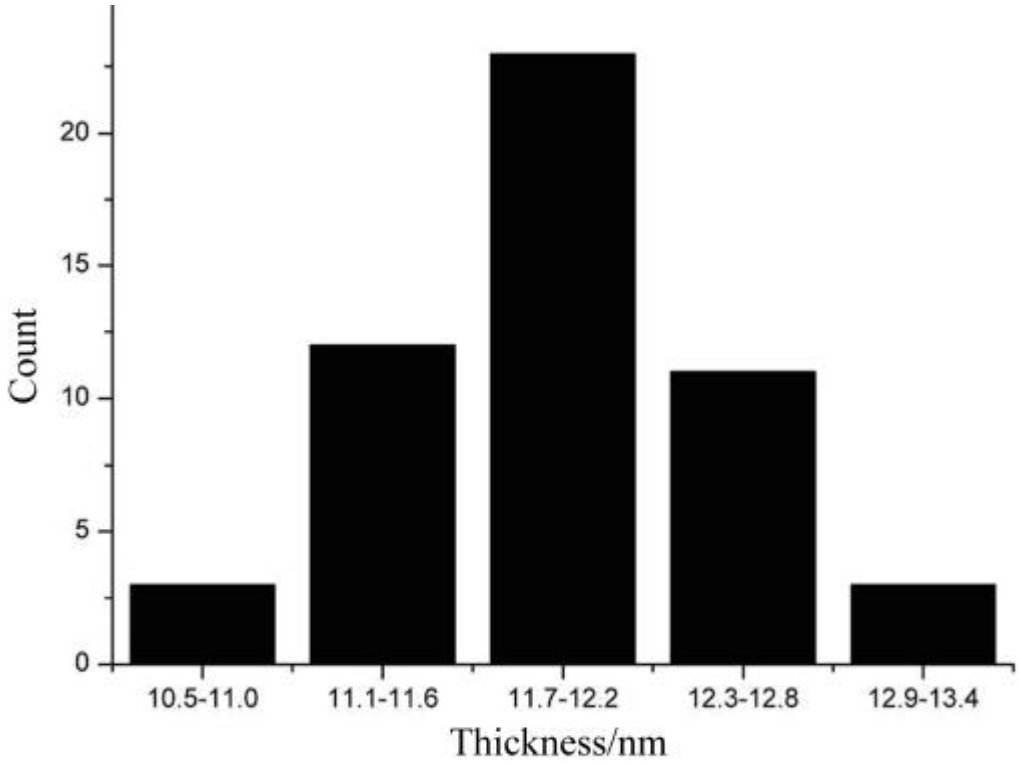
SFigure 11. Particle thickness size distributions for Cu_2S nanodisks produced at 210 °C for 10 hours; the average thickness is ~12.0 nm (s = ±7.1%).



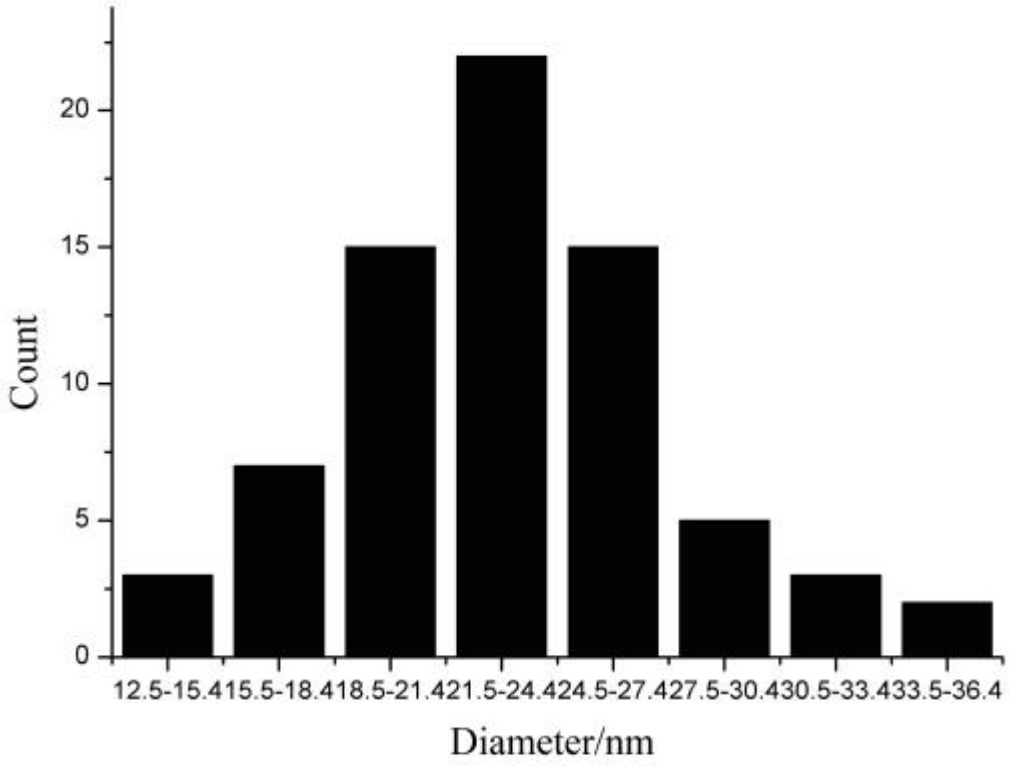
SFigure 12. Particle diameter size distributions for Cu_2S nanoparticles produced at 220 ℃ for 0.5 hour; the average diameter is ~5.5 nm (s = ±7.7%).



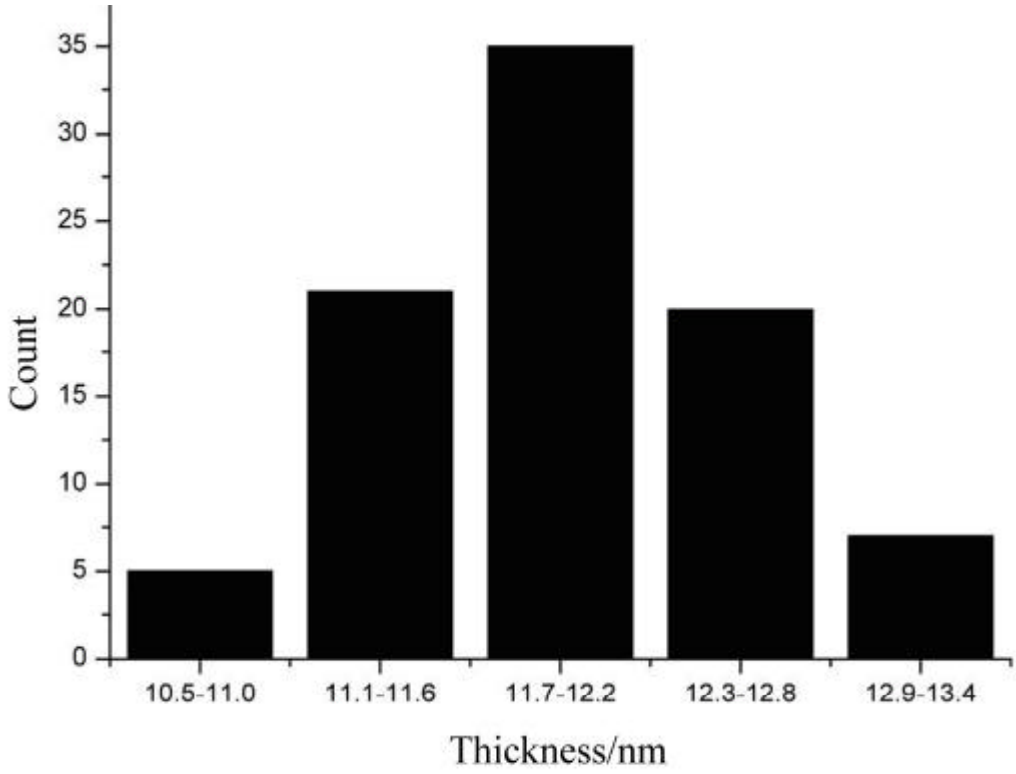
SFigure 13. Particle diameter size distributions for Cu_2S nanodisks produced at 220 °C for 1 hour; the average diameter is ~21.7 nm (s = ±24.1%).



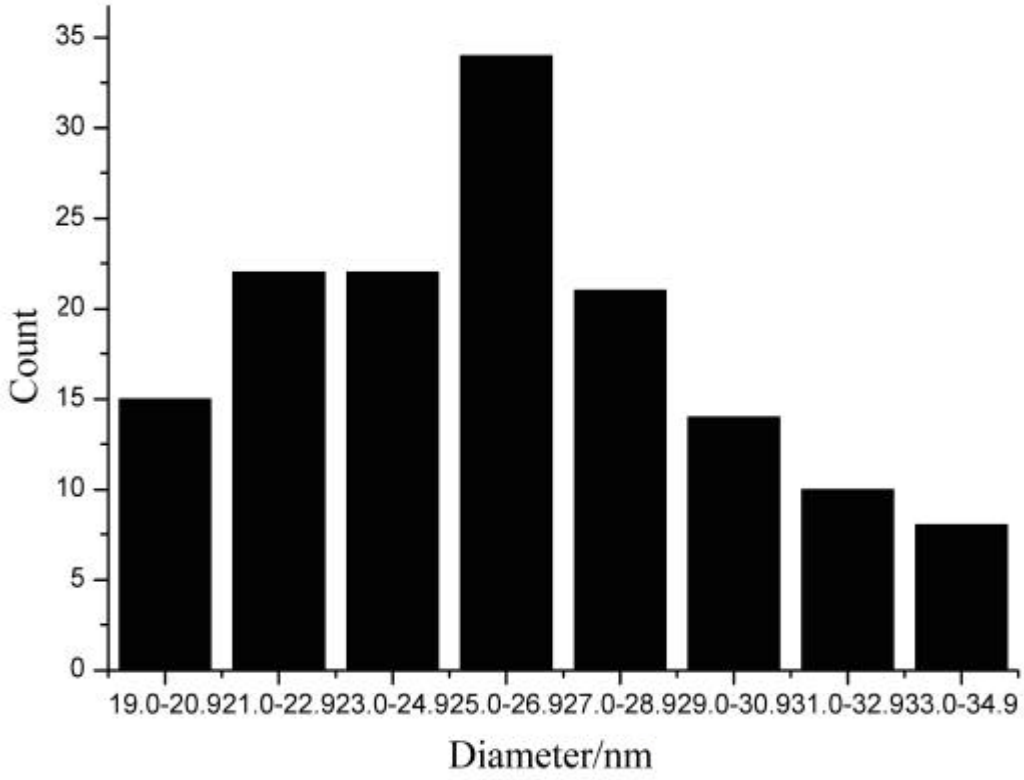
SFigure 14. Particle thickness size distributions for Cu_2S nanodisks produced at 220 °C for 1 hour; the average thickness is ~11.9 nm (s = ±6.3%).



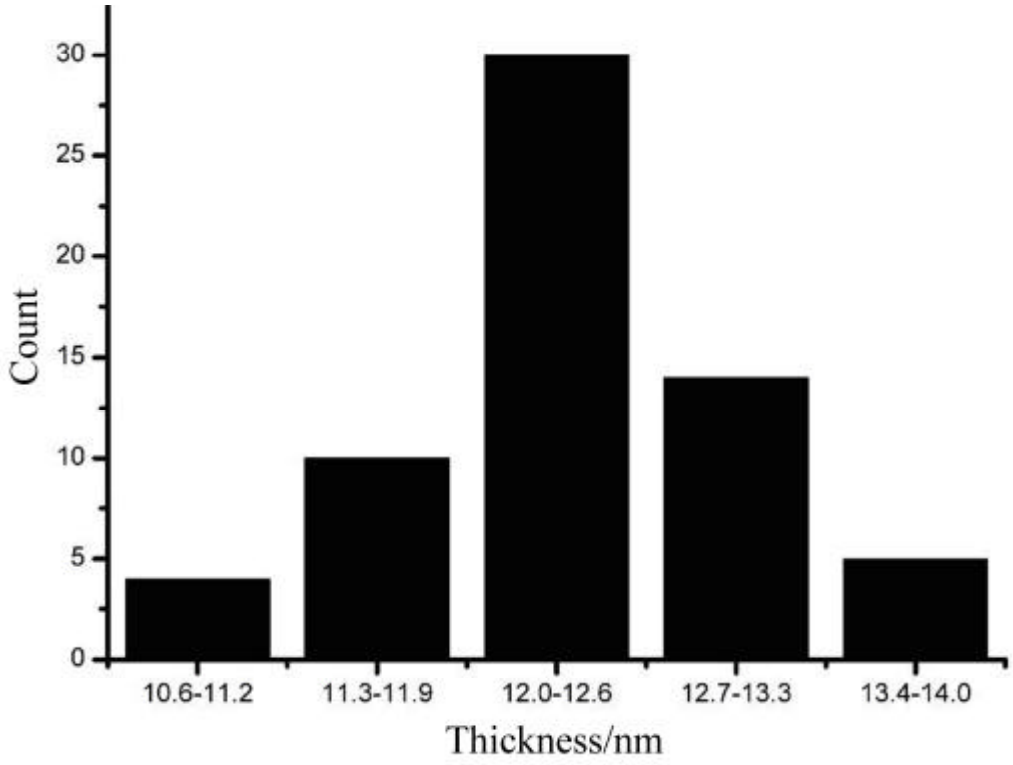
SFigure 15. Particle diameter size distributions for Cu_2S nanodisks produced at 220 °C for 2 hours; the average diameter is ~23.2 nm (s = ±18.5%).



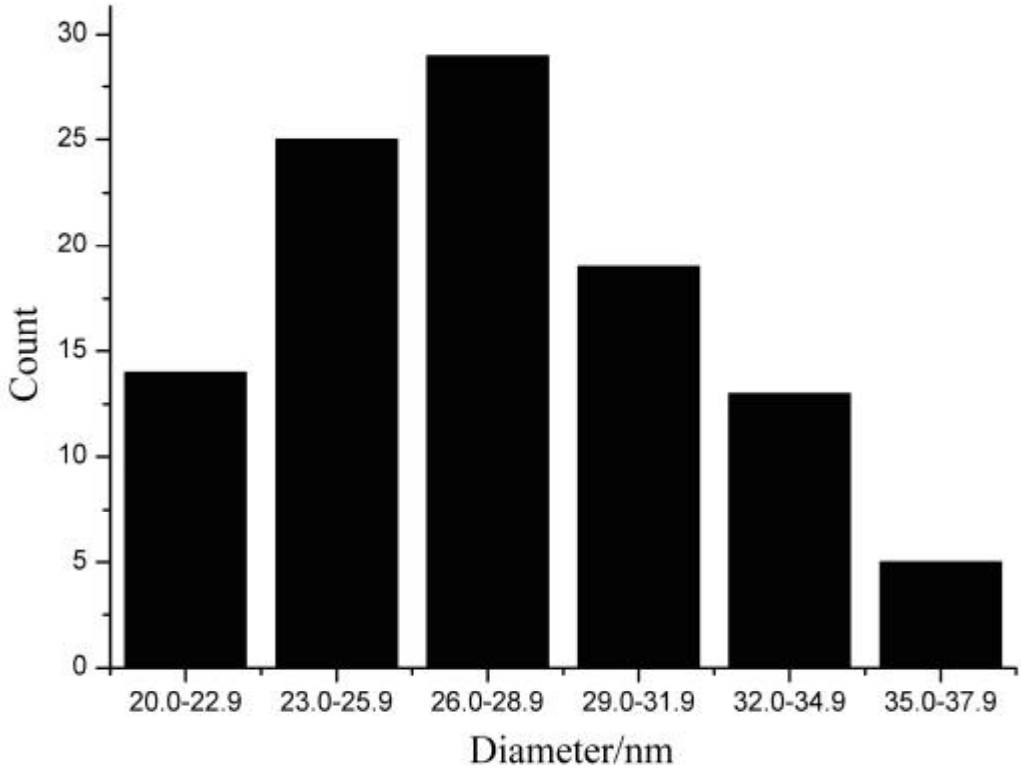
SFigure 16. Particle thickness size distributions for Cu_2S nanodisks produced at 220 °C for 2 hours; the average thickness is ~12.0 nm (s = ±5.3%).



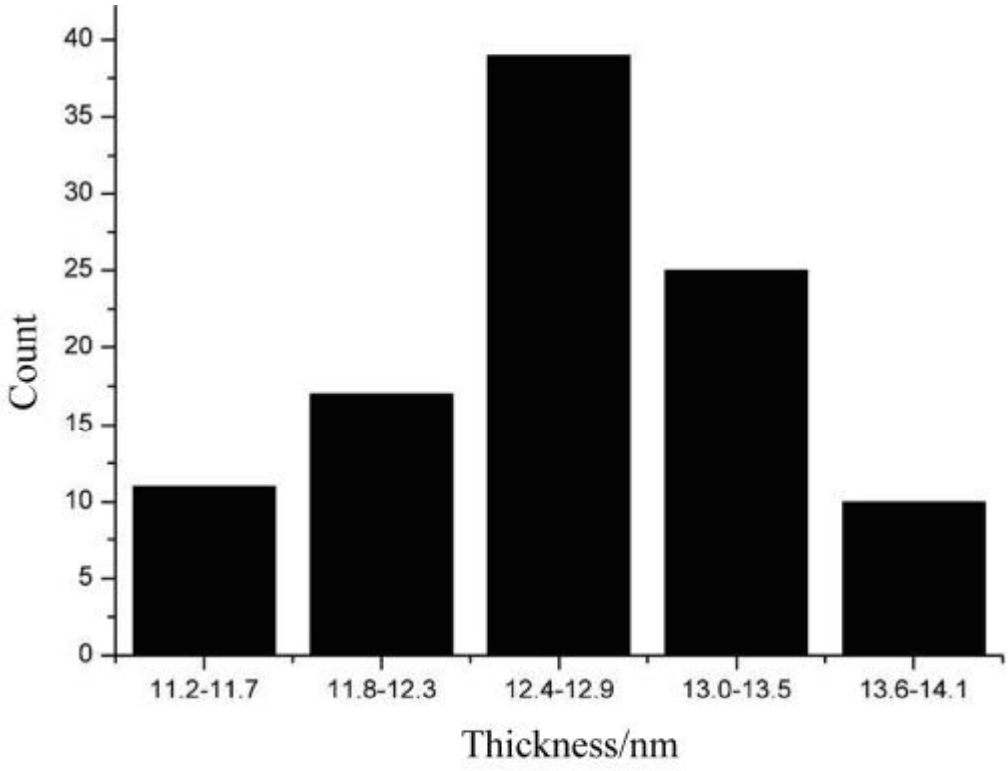
SFigure 17. Particle diameter size distributions for Cu_2S nanodisks produced at 220 °C for 4 hours; the average diameter is ~26.0 nm (s = ±14.9%).



SFigure 18. Particle thickness size distributions for Cu_2S nanodisks produced at 220 °C for 4 hours; the average thickness is ~12.3 nm (s = ±6.5%).



SFigure 19. Particle diameter size distributions for Cu_2S nanoplatelets produced at 220 °C for 10 hours; the average diameter is ~27.5 nm (s = ±14.7%).



SFigure 20. Particle thickness size distributions for Cu_2S nanoplatelets produced at 220 °C for 10 hours; the average thickness is ~12.7 nm (s = ±5.4%).