

List of Tables

Table No.	Table caption	Pg. No.
1.1	Various areas where nanoscience and nanotechnology is expected to have a significant impact on energy systems	14
2.1	Comparison of various heat transfer enhancement methods based on geometrical modifications in solar air heaters	40
2.2	Comparison of various heat transfer enhancement methods based on geometrical modifications in solar water heaters	42
2.3	Comparison of various solar selective coatings	46
2.4	Solar energy absorption using copper nanofluid	55
2.5	Solar energy absorption using aluminium nanofluid	58
2.6	Solar energy absorption using CuO nanofluid	60
2.7	Solar energy absorption using Fe ₂ O ₃ (iron oxide) nanofluid	63
2.8	Solar energy absorption using SiO ₂ nanofluid	65
2.9	Solar energy absorption using ZnO nanofluid	67
2.10	Solar energy absorption using TiO ₂ nanofluid	69
2.11	Solar energy absorption using carbon nanofluid	71
3.1	Effect of surfactant concentration on particle size of Cu nanoparticles	111
3.2	Solar thermal efficiency values for different particle concentrations of Cu nanoparticle (100 nm) in water	118
3.3	Solar thermal efficiency values for different particle concentrations of Al nanoparticle (150-250 nm) in water	122
3.4	Solar thermal efficiency values for different particle concentrations of Cu nanoparticle (100 nm) for desalination of hard water	126
3.5	Solar thermal efficiency values for different particle concentrations of Al nanoparticles (150 to 250 nm) for desalination of hard water	129
3.6	Concentration (in weight %) of ethanol-water mixture versus specific gravity at 20 ⁰ C	130
4.1	Solar thermal efficiency values for different particle concentrations of CuO nanomaterial (133 nm) in water	158

4.2	Solar thermal efficiency values in water, MEG and silicone oil for different sizes of CuO nanomaterial (0.05% by volume)	161
4.3	Solar thermal efficiency values for different particle concentrations of Fe ₂ O ₃ nanoparticles (300 nm) in water	163
4.4	Solar thermal efficiency values for different particle concentrations of CuO nanomaterial (133 nm) for desalination of hard water	167
4.5	Solar thermal efficiency values for different particle concentrations of Fe ₂ O ₃ nanoparticles (300 nm) for desalination of hard water	169
5.1	Solar thermal efficiency values for different particle concentrations of SiO ₂ (23 nm) nanoparticles in water	204
5.2	Solar thermal efficiency values for different particle sizes of SiO ₂ nanoparticles in MEG	206
5.3	Solar thermal efficiency values for different particle sizes of SiO ₂ nanoparticles in silicone oil	207
5.4	Solar thermal efficiency values for different particle concentrations of ZnO QDs (10 nm) in water	210
5.5	Solar thermal efficiency values for different particle concentrations of ZnO NWs (200 to 300 nm) in water	213
5.6	Solar thermal efficiency values for different particle concentrations of TiO ₂ Aeroxide [®] P25 (21 nm) in water	217
5.7	Solar thermal efficiency values for different particle concentrations of TiO ₂ Aeroxide [®] P90 (14 nm) in water	221
5.8	Solar thermal efficiency values for different particle concentrations of TiO ₂ NTs (12 to 29 nm diameter) in water	225
5.9	Solar thermal efficiency values for different particle concentrations of TiO ₂ NWs (15 to 29 nm diameter) in water	229
5.10	Solar thermal efficiency values for different particle concentration of SiO ₂ nanoparticles (65 nm) for desalination of hard water	233
5.11	Solar thermal efficiency values for different particle concentration of SiO ₂ nanoparticles (23 nm) for desalination of hard water	235
5.12	Solar thermal efficiency values for different particle concentration of ZnO QDs (10 nm) for desalination of hard water	237

5.13	Solar thermal efficiency values for different particle concentration of ZnO NWs (200 to 300 nm) for desalination of hard water	239
5.14	Solar thermal efficiency values for different particle concentration of TiO ₂ Aeroxide [®] P25 (21 nm) for desalination of hard water	241
5.15	Solar thermal efficiency values for different particle concentration of TiO ₂ Aeroxide [®] P90 (14 nm) for desalination of hard water	244
5.16	Solar thermal efficiency values for different particle concentration of TiO ₂ NTs (12 to 29 nm diameter) for desalination of hard water	245
5.17	Solar thermal efficiency values for different particle concentration of TiO ₂ NWs (15 to 29 nm diameter) for desalination of hard water	248
6.1	Solar thermal efficiency values for different particle concentrations of carbon nanoparticles (30 nm)	270
6.2	Solar thermal efficiency values for different particle concentrations of carbon nanoparticles (30 nm) for desalination of hard water	279