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Ag-H₂O nanofluids by pulsed laser liquid-solid interaction for heat removal in electronics devices

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We present Pulsed Laser Ablation in Liquid Solution (PLAL), a one-step pulsed laser ablation technique that produces a stable Ag-H₂O nanofluid with improved thermal conductivity. Throughout the synthesis procedure, several deposition durations and fluences of the Nd YAG. Spherical nanoparticles (21–37 nm) having instability at higher concentrations are revealed by characterization. At 45°C (t_a = 5 min), the thermal conductivity improvement is readily visible and reaches a maximum within 14–20%. In terms of the contact angle, laminar flow at the Cu interface is most likely indicated by $\Delta\theta < 95^\circ$. The impact of fluid flow is highlighted by concentration-dependent effects on the contact angle. Tube surface design emphasises design considerations via influencing flow.

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