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Title:	Development of all - solid - state cooled high-power blue laser system and its application in colorization of copper
Authors:	Jakhar, Sandeep
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Abstract:	In this MS thesis, we demonstrated an all-solid-state (coolant-free) blue laser emitting more than 100 Watt continuous output and showed that it enables rapid photochemical coloration of copper surface in ambient conditions. The laser system is systematically characterized for optical, electrical, and thermal performance. We observe the rapid color transformation of the copper surface into black or red, depending on the fluence owing to controlled oxidation of its surface without bulk melting. This procedure allows black/red engraving on copper and rapid formation of copper oxides for various applications. Our approach reduced the overall size and weight of the high-power blue laser and made it liquid-free, opening analogous photochemical surface transformation of other metals.
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