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Experimental studies for comparing the performance of different quenchant oils in terms of their cooling properties, mechanical properties and microstructure

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Abstract

The authors conducted experiments for comparing the performance of different quenchant oils in terms of their cooling properties, mechanical properties and microstructure. They considered comela, soyabean, corn, cotton seed and sunflower oils and their suitability as quenchants. Based on their experiments they suggested that any of the vegetable oil evaluated could be blended with minimum impact on viscosity, although compositional differences may effect oxidation stability. Further, similar cooling profiles were obtained by different vegetable oils. They observed absence of film boiling with any of the vegetable oils and heat transfer occurred only by pure boiling convection. High temperature cooling properties of vegetable oils are faster than those of petroleum oil based quenchants. In their experimental work they measured viscosity at 40-100⁰c. They also considered composition analysis and kinematic viscosity properties of different oils. They finally evaluated the quenching performances of the vegetable oils.