Biodiesels from three feedstock : the effect of graphene oxide (GO) nanoparticles diesel engine parameters fuelled with biodiesel

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ABSTRACT

Physicochemical characteristics of three type biodiesel feedstock and diesel engine parameters fuelled with graphene oxide (GO) nanoparticles addition in diesel/biodiesel blends have been investigated. Three types of oilseeds, namely Evening primrose (*Oenothera lamarckiana*), the fruit of Tree of heaven (*Ailanthus altissima*) and Camelina (*Camelina sativa*), were selected as suitable resources for Iran. The result showed that the Tree of heaven contains 38% oil which is higher than the Evening primrose (26%) and Camelina (29%). Physicochemical properties of the oils showed that the viscosity of the Camelina oilseeds was less than the Tree of heaven oilseeds and Evening primrose oilseeds. Therefore, in terms of viscosity, the Camelina oilseeds is preferable. Experimental results showed that the biodiesel from all three types of oilseeds are consistent with the ASTM biodiesel standards. However, Camelina biodiesel has better physicochemical properties than another feedstock. Therefore, biodiesel of Camelina oil can be an appropriate alternative to diesel fuels in Iran. Performance and emission parameters of diesel engine fuelled with graphene oxide (GO) nanoparticles addition in three biodiesel resources compared with diesel. A reduction in UHCs, CO, and BSFC with a penalty of increased NO_x emissions was realized with all graphene oxide (GO) nanoparticles addition in diesel/biodiesel blends. Also, with Camelina biodiesel, the power increased.

KEYWORDS

Biodiesel; Diesel engine; Camelina; Physicochemical properties; Graphene oxide

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