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Smart bioactive compounds: Their synthesis and potential application in biodiesel oxidation stability enhancement.

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The key problem associated with the use of biodiesel is its low oxidation stability which affects its storage and makes it unsuitable for engine. The oxidation of the biodiesel primarily increases the peroxide value and then a decrease as primary products degrades to form secondary products. The increase in peroxide value can impart the rise in cetane number, which reduces ignition delay and can cause various engine problems. As an option to stop or slowing down the oxidation process, antioxidants are added to inhibit the initiation and propagation of free radicals, reducing the formulation of secondary degradation compounds. Butylated hydroxytoluene (BHT), butylated hydroxyanisol (BHA), tert.-butylhydroquinone (TBHQ) and propyl gallate (PG) are commonly used synthetic antioxidants in biodiesel. These synthetic antioxidants are made from non-renewable sources and has carcinogenic health constrains for the living organisms directly exposed to them, because of these negative attributes renewable antioxidant sources containing phenolic compounds are more desirable than the synthetic antioxidants.

In this context, Bio-active compounds like polyphenols which are present in various natural plant based materials and they are very important constituents and plays a crucial role in protecting lipid oxidation. Ginger extract contains phenolic compounds naming gingerol and shoagol which are effective agents for stopping radical propagation. Ginger extract presented greater protection for biodiesel during the oxidation stability test by Rancimat method. A higher percentage of added nature based robust ginger extracts results in the enhancement of the oxidation stability due to the presence of more antioxidant compounds in it.

Biography

Anuchaya devi is a Research scholar, Currently in 4th year of her Ph.D at Department of Energy, Tezpur University. She did her Master degree in Environmental Science from Department of Environmental science, Tezpur University. She has published a number of research articles, book chapters and books in the field biodiesel fuel quality enhancement. She has developed designer biodiesel by blending different non-edible oils in different volumetric ratios with improved fuel quality. In recent times, she is focused on searching some alternative natural antioxidant sources which can be applied to biodiesel in place of synthetic antioxidants for protecting biodiesel from oxidation.

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