The engine combustion tests at various engine speeds and full load indicated a 4-5% reduction in the CO_2 and NO_x emissions for the optimum fuel ME compared to neat gasoil, while HC and CO emissions were increased by about 18.4% and 1.18%, respectively.

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USING ALKYL IMIDAZOLIUM BASED IONIC LIQUIDS AS SURFACTANTS TO PREPARE MICROEMULSION OF GASOIL/VEGETABLE OIL

Increasing of the global concern about the high energy consumption of the world, diesel fuel has entered into the researcher’s center of attention. This energy carrier has turned to a major source of pollutants and suspended particles. Vegetable oils as a renewable fuel have good heating power and the potential to reduce carbon emissions [1]. The use of microemulsion water in a blend of gasoil and vegetable oil is a way to reduce the pollution of diesel engine [2,3]. The method that has been taken to major reduce the emissions of diesel engines is to use microemulsion water in diesel. The microemulsion technique as a significant approaches introduced to decrease the problems encountered eradicate neat diesels [3]. Microemulsions consist of two immiscible liquids, which are stabilized by surfactants and have thermo-dynamic stability. In recent decades ionic liquids have attracted widely attention as green solvents that are used in various applications. These compounds can have been used to form microemulsions as scattering intermediates, polar phase and recently used as surfactants [4]. Ionic liquids base on alkyl imidazolium have the ability to form self-aggregation structures similar to micelles in microemulsion [5]. A microemulsion of gasoil/vegetable oil (80:20), water and 1-butanol as co-surfactant in the presence of $BmimNO_3$ and $C12mimNO_3$ ionic liquids and Span80 as surfactant were prepared and their phase diagrams were plotted. Comparison of the phase diagrams of the samples has revealed a larger single phase region for samples prepared with ionic liquids than the conventional Span80 surfactant. In Figure (1) the phase diagram for micro-emulsion system in the present of the conventional surfactant Span80, [Bmim][NO_3] and [C12mim][NO_3] ionic liquids, blend of surfactant Span80 and each of these ionic liquids with a ratio of 50:50 has been shown.

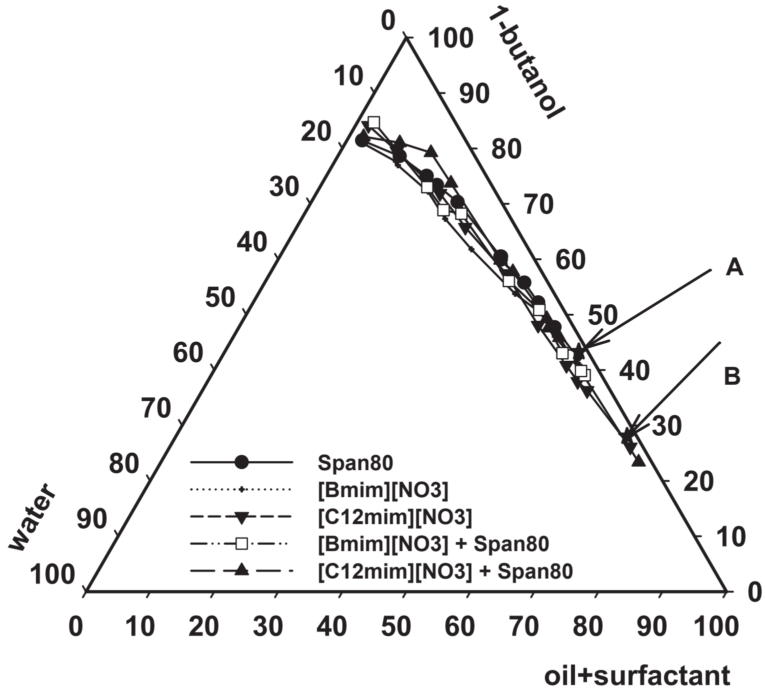

Figure 1 - The phase diagram of gasoil/vegetable oil of sunflower oil (80:20 wt %), water, surfactant (ionic liquids, Span80 and blend of ionic liquids with Span80) 1-butanol with γ=0.05 at room temperature and 750 rpm

Through the phase diagrams two samples with high percentage of oily phase were selected and their kinematic, dynamic viscosity was measured and compared with pure diesel fuel according to the standards. The result indicated that these samples have a very close values to net diesel fuel. Figure 2 shows the dynamic viscosity of samples.

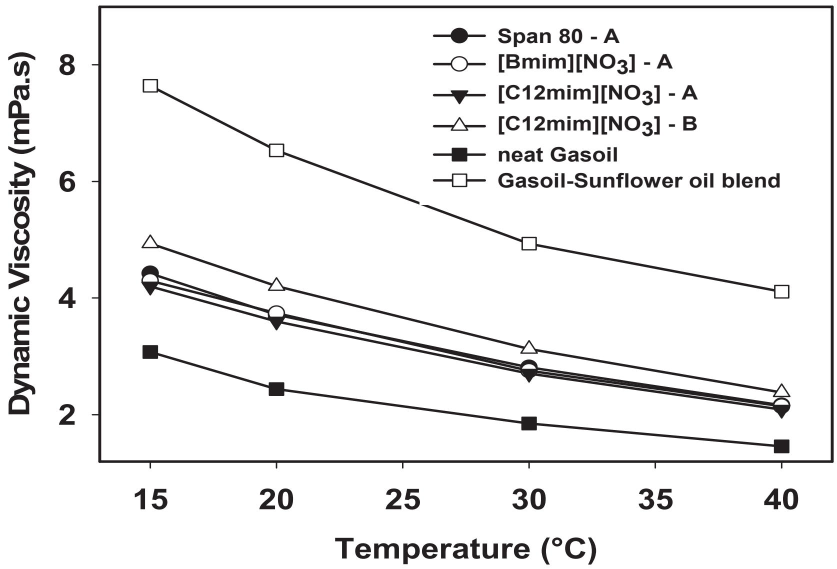

Figure 2 – Comparison of the dynamic viscosity of samples A and B prepared with Span80 and $BmimNO_3$ and $C12mimNO_3$ ionic liquids

According to the ASTM D445 the kinetic viscosity at 37.5°C temperature that is 2.0-2.5 mm^2 / s .Viscosity data obtained of the samples are desirable and nearby to pure diesel fuel.

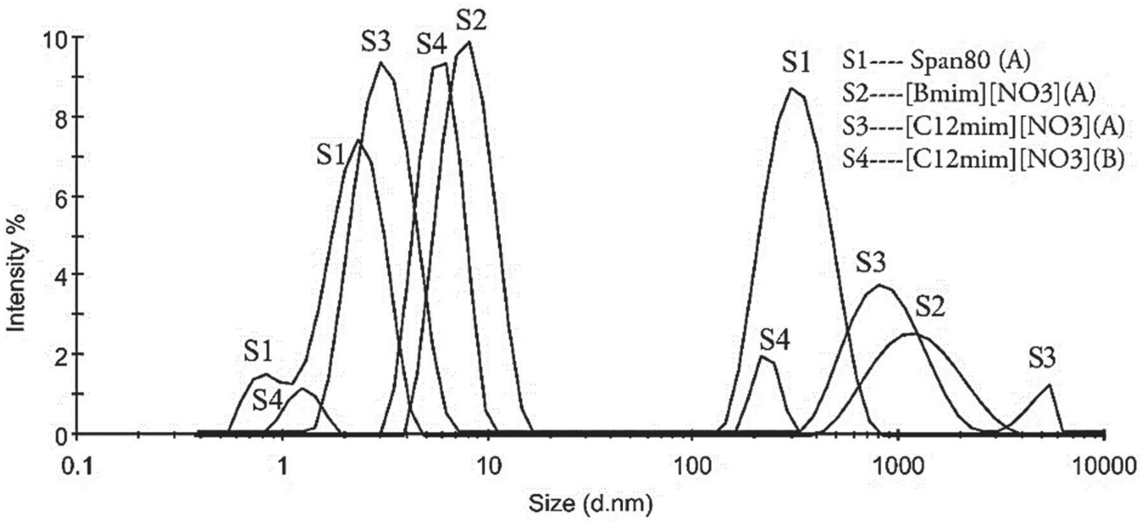

Figure 3 – The hydrodynamic size distribution diagrams of water droplets in Samples of points A and B

In microemulsion systems, the size of water droplets and size distribution of these droplets is important in the stability of the microemulsion. The more water droplets are smaller and narrower distributed, the greater stability of the system. Fig (3) indicate the size and size distribution of droplets. 8.706nm (upto 70.4%) for [Bmim][NO_3] 3.358 nm (upto 64.50%) for[C12mim][NO_3] in point A, 6.153nm (upto 82.30%) for [C12mim][NO_3] in point B and 331.0nm (upto 53.7%) for Span80 in microemulsions. The DLS analysis of water droplets in the samples indicated a very narrow size distribution for these sample. In microemulsions prepared with ionic liquids, main percentage of water droplets were shown to be less than 10 nm.

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ИССЛЕДОВАНИЕ ПРОЦЕССОВ ПОЛУЧЕНИЯ ЭКСТРАКЦИОННОЙ ФОСФОРНОЙ КИСЛОТЫ ИЗ ФОСФОРИТОВ МАРОККО РАЗЛИЧНЫХ МАРОК

В связи с сокращением высококачественных апатитовых руд, увеличении стоимости фосфатного сырья и ограничениями в возможности его поставок стоит вопрос в применении новых видов фосфатного