

# **Deacidification of degumming soybean oil by liquid-liquid extraction with emphasis on the retention of tocopherols and tocotrienols.**

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Vegetable oils are important components of human diet. They are a source of energy and are responsible for transporting liposoluble vitamins by the body, they are also associated with prevention of chronic diseases such as cardiovascular. Soybean is the crop that stands out on the national scene, due to its large-scale production. Its products are very versatile, the best known is the soybean oil, which can be used for both human consumption and for biodiesel production, in both case the vegetable oil must be refined. Crude vegetable oils present in their composition less than 5 % of minor compounds, including tocopherols, tocotrienols, carotenoids, phosphatides, free fatty acids, among other components, but during the refining steps, the majority of these compounds are reduced. In oil refining, the deacidification or removal of free fatty acids is the most important and it is usually performed by chemical or physical method. An alternative to the deacidification is the liquid-liquid extraction or solvent refining, process carried out at mild conditions, mainly at room temperature and atmospheric pressure. In this process, the loss of neutral oil and energy consumption are reduced and no polluting residues are formed. Taking into account, the goal of this work was the determination of Liquid-Liquid Equilibrium (LLE) for systems composed by degummed soybean oil + commercial linoleic acid + anhydrous ethanol + water at temperatures of 298.15 K and 223.15 K, with emphasis on the retention of tocopherols and tocotrienols in oil phase. These compounds, known as vitamin E, have antioxidant activity. The results presented that the addition of water in the solvent, ethanol, increased the heterogeneous area. The distribution coefficient of linoleic acid depends on the temperature and employed solvent. The distribution coefficient of tocopherols was more than unity, indicating that they have a preference for the oil phase.

Supported by FAPESP (2008/56258-8), CNPQ (304495/2010-7+480992/2009-6) and CAPES (scholarship)

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