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A Simple Technique of Liquid Purity Analysis and Its Application to Analysis of Water Concentration in Alcohol-Water Mixtures DILIP DE, Kaduna State University, Kaduna, Kaduna State, Nigeria, ABDUL AZIZ DE, FUTY, Yola, Adamawa State, Nigeria — The change of activation energy of a liquid molecule and hence its viscosity coefficient with addition of contaminants to the original liquid gives rise to a new technology for analysis of purity of the liquid. We discovered that concentration of certain contaminants such as water in alcohol or vice versa can be uniquely and accurately determined in a short time (about 10-15 minutes) using a simple and yet innovative technique that only requires measurement of time of flow of the impure liquid (say, water-alcohol mixture) and distilled water through a simple viscometer. We determined the increase of activation energy of alcohol molecules with increase of water concentration for ethyl and methyl alcohol. Our detailed investigation on the alcohol-water mixtures along with discussion on possible future potential application of the simple and very reliable inexpensive technique for liquid purity analysis is presented. We compared our present method with other methods on the accuracies, problems and reliability of impurity analysis in liquids. We also discuss a part of the quantum theory of viscosity of liquid mixtures that is in the developmental stage.

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