Liquid-liquid equilibria for binary system of Di-methyl carbonate(DMC) + water and the ternary systems of DMC + C1～C4 alcohols + water at 298.15 K

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Recently, methyl tert-buthyl ether(MTBE), a widely used gasoline additive for octane and oxygen enhancement, was found polluting the groundwater and being not biodegradable, as a result, the research activity related to DMC has increased greatly. DMC can be prepared, for example, by reacting carbon monoxide, methanol and an acid by using copper chloride; by trans-esterifying a cyclic carbonate, such as ethylene/propylene carbonate, with methanol in the presence of a catalyst, and by vapour phase reaction of carbon monoxide and nitrite in the presence of a catalyst. In this study, The tie-line end compositions of four ternary systems of Di-methyl carbonate(DMC) + C1～C4 alcohols + water were experimentally determined at 298.15 K by using a static apparatus. These C1～C4 alcohols are methanol, ethanol, 1-propanol, 2-propanol, 1-butanol and 2-butanol. Measured tie lines data have been correlated using the NRTL and UNIQUAC equations, and showed good agreement.