

Solid-Liquid Equilibrium, excess molar volume and deviation in molar refractivity for binary systems of gamma-Butyrolactone with Dimethyl carbonate, ethylene carbonate and ethyl methyl carbonate

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Owing to the research and development on lithium-ion batteries, electric vehicle power source and the performance of mobile IT products in the 21st century has been improved. The electrolyte liquid solvent is mainly consisted of cyclic or linear carbonate and some additives. The purpose of this study is therefore to show the thermodynamic properties for the optimized conditions by knowing the melting temperature and mixture properties for the binary mixture of electrolyte. In this work, electrolyte additive such as gamma-Butyrolactone is used to supplement for the deficient properties. The solid-liquid equilibrium for GBL contained binary systems were analyzed by visual method. SLE data of dimethyl carbonate + GBL, ethyl methyl carbonate + GBL, ethylene carbonate + GBL these binary mixtures were measured and the eutectic points were confirmed. In addition, the density and refractive index were measured by precision densitometer and refractometer. The excess molar volumes and deviations in molar refractivity data were then reported at 298.15 K under atmospheric pressure.