

Designação do Projeto	ILGerants: Novas Misturas para Refrigeração por Absorção baseados em Líquidos Iónicos
Código do Projeto	LISBOA-01-0145-FEDER-032066
Objetivo Principal	Reforçar a investigação, o desenvolvimento tecnológico e a inovação
Região de Intervenção	Lisboa
Entidade Beneficiária	FCiências.ID – Associação para a Investigação e Desenvolvimento de Ciências
Data de Aprovação	03-05-2018
Data de Início	01-07-2018
Data de Conclusão	30-06-2022
Custo Total Elegível	239.885,20€
Apoio Financeiro da União Europeia	FEDER – 95.954,08€
Apoio Financeiro Público Nacional/ Regional	OE – 143.931,12€

Objetivos

Contribute to the definition of new refrigeration mixtures, based on non-toxic ionic liquids, aiming alternatives to the fluids currently used in industry, namely water+ LIBr and water + NH₃. The advantages associated with negligible vapor pressures, greater heat capacity, and variable viscosities will be tuned in mixtures with molecular solvents targeting cost/efficient systems.

Atividades

The systems studied were: [Emim][EtSO₄]+ W (0<x_{IL}<1) between 293 and 333 K, [Emim][OTF]+ W (0<x_{IL}<1) between 293 and 333 K, Cho][OAc]+W (0<x_{IL}<0.4) between 293 and 333 K, and density, speed of sound, refractive index, electrical conductivity, viscosity, thermal conductivity and surface tension were evaluated; and density, speed of sound, refractive index, electrical conductivity, viscosity, thermal Short chain imidazolium IL were chosen to minimize environmental impact. Targeting the evaluation of nontoxic IL, an acetate based amino acid derived IL was also included in the study, notwithstanding being a room temperature solid.

Resultados Atingidos

The analysis of the experimental data allowed the definition of a working fluid composition for use as an absorbent in absorption refrigeration systems, namely useful mixture range is restricted to 0 <x_{IL} ≤ 0.2 due to the high IL viscosities. The performance of the mixtures shows an anion dependence with [Emim][OTF]+water system presenting a slightly better performance than [Emim][EtSO₄]+water. The selection of the best refrigerant pair depends on the toxicity data currently under evaluation. The potentially best refrigerant pair in terms of environmental friendliness should be [Cho][OAc]+water mixtures with 0<x_{IL}≤ 0.2.

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