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**Design and development of low pressure evaporator/condenser unit for water-based adsorption type climate control systems.** ARJUN VENKATARAMANAN, CARLOS A. RIOS PEREZ, CARLOS H.HIDROVO, Northeastern Univ — Electric vehicles (EVs) are the future of clean transportation and driving range is one of the important parameters which dictates its marketability. In order to increase driving range, electrical battery energy consumption should be minimized. Vapor-compression refrigeration systems currently employed in EVs for climate control consume a significant fraction of the battery charge. Thus, by replacing this traditional heating ventilation and air-conditioning system with an adsorption based climate control system one can have the capability of increasing the drive range of EVs.The Advanced Thermo-adsorptive Battery (ATB) for climate control is a water-based adsorption type refrigeration cycle. An essential component of the ATB is a low pressure evaporator/condenser unit (ECU) which facilitates both the evaporation and condensation processes. The thermal design of the ECU relies predominantly on the accurate prediction of evaporation/boiling heat transfer coefficients since the standard correlations for predicting boiling heat transfer coefficients have large uncertainty at the low operating pressures of the ATB. This work describes the design and development of a low pressure ECU as well as the thermal performance of the actual ECU prototype.

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