**Link:** <https://solar-power-tech.com/e-posters/influence-of-water-in-imidazolium-and-picolinium-based-electrolytes-used-in-electrochemical-reduction-of-co2/>

**Abstract**

The use of ionic liquids (ILs) as electrolytes for electrochemical reduction of CO2 powered by renewable energy, in particular by solar energy, is getting more attention due to their recognized green nature and excellent characteristics, such as non-volatility, high CO2 solubility, high conductivity, and large electrochemical window [1, 2]. The development of a process to produce syngas (CO + H2) using IL electrolytes based on 1-ethyl-3-methyl-imidazolium trifluoromethanosulfonate [EMIM][TfO] was reported elsewhere [3, 4]. More recently, the use of ILs for solar-driven electrochemical reduction of CO2 was successfully demonstrated [5].

The present work characterizes electrochemically several aqueous IL electrolytes, such as [EMIM][TfO]-based electrolyte with aqueous 1-ethyl-3-methylpyridinium trifluoromethanesulfonate [C2-3pic][TfO] and 1-ethyl-4-methylpyridinium trifluoromethanesulfonate [C2-4pic][TfO]. The objective of this work is to study the influence of the presence of imidazolium cation or picolinium (methylpyridinium) cation in electrochemical CO2 reduction and further applications in photoelectrochemical (PEC) devices. The results showed that the picolinium-based electrolytes exhibited similar syngas productions at higher water contents when compared with imidazolium-based electrolytes in the low overpotential region.