

Tragacanth gum as new binder for Lithium-ion battery

The production of greener, sustainable and cheaper batteries is strategic for the development of Lithium-ion battery technology. Current preparation of active material slurries for electrodes of Lithium-ion batteries employs Polyvinylidene Fluoride (PVdF).

Unfortunately, there are some disadvantages related to the use of PVdF. First, the binder requires the use of toxic and environmentally unfriendly solvents in the processing, such as N-methyl-pyrrolidone (NMP). Second, PVdF is costly and there are difficulties related to its recovery at the end of the battery life. In this study we use Tragacanth gum as a binder, which has never been taken into consideration for these applications before. Tragacanth gum is completely natural and it is one of the three most important exudate gums (with Arabic gum and Karaya gum).

This activity is carried out within the H2020 project eCAIMAN (EC grant No. 653331). The interest of the industry in this field is very clear as there will be a decrease in the total cost of the cell and a very lower environmental impact.

We found that this water-soluble binder, besides having good electrochemical performances (330–350 mAhg⁻¹ at C/10), showed a high adhesion to the current collector and a good electrochemical stability under the experimental conditions employed, which make this Tragacanth gum interesting for the next generation of Lithium-ion batteries. eCAIMAN is addressing sustainability in the choice of non-critical raw materials and the use of aqueous binders •

