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Scientists in Russia have designed a whole series of new compounds that could serve as catholytes and anolytes in organic redox flow batteries. The materials promise to open up new pathways for further research, and overcome some of the challenges for organic redox flow batteries in commercial, large-scale energy storage projects.

Thanks to the potential size of the market for electric vehicles, battery research in recent years has tended to

focus on innovations in lithium-ion and other related chemistries that promise to serve this market.

Romadina is the lead author of two new papers exploring new organic materials for RFBs, published in the Journal of Materials Chemistry A and in Chemical Communications. The first evaluated a series of seven promising catholyte materials, and the second describes the synthesis of a phenazine-based anolyte material.

Combining the two resulted in a flow battery that achieved a high cell voltage of 2.3 V and better than 95% coulombic efficiency, as well as high capacity and good stability over 50 cycles. This battery is described further in the Chemical Communications paper.