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**Research areas** : Supercapacitor & water splitting  
**Title of the research** : Morphological evolution of high energy hybrid supercapacitor applications  
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#### **Description of current and past research:**

A hybrid supercapacitor with improved efficiency in energy density without altering the efficiency in power density has been developed in recent years. My research work is mainly focusing on the preparation of hybrid electrode materials for high energy hybrid supercapacitor applications. Importantly, extensive interest has been paid to synthesis quaternary chalcogenides and rare-earth-based metal oxide. We hope that quaternary chalcogenide and rare-earth-based transition metal oxides materials will meet the above requirements and solve the problems effectively.

#### **Journal publications:**

1. **Isacfranklin, M.**, Yuvakkumar, R., Ravi, G., Hong, S.I., Velauthapillai, D., Thambidurai, M., Dang, C., Algarni, T.S. and Al-Mohaimed, A.M., Heterostructured SmCoO<sub>3</sub>/rGO composite for high-energy hybrid supercapacitors, *Carbon*, 172, (2021) 613-623. [I.F: 8.821] <https://doi.org/10.1016/j.carbon.2020.10.081>
2. **Isacfranklin, M.**, Yuvakkumar, R., Ravi, G., Hong, S.I., Shini, F., Thambidurai, M., Dang, C. and Velauthapillai, D., Marigold flower like structured Cu<sub>2</sub>NiSnS<sub>4</sub> electrode for high energy asymmetric solid-state supercapacitors, *Scientific reports*, 10(1), (2020) 1-12. [I.F: 3.998] <https://doi.org/10.1038/s41598-020-75879-9>
3. **Isacfranklin, M.**, Yuvakkumar, R., Ravi, G., Velauthapillai, D., Pannipara, M. and Al-Sehemi, A.G., Superior supercapacitive performance of Cu<sub>2</sub>MnSnS<sub>4</sub> asymmetric devices, *Nanoscale Advances*, 3(2), (2020) 486-498. [I.F: -] <https://doi.org/10.1039/D0NA00775G>

4. **Isacfranklin, M.**, Ravi, G., Yuvakkumar, R., Kumar, P., Velauthapillai, D., Saravanakumar, B., Thambidurai, M. and Dang, C., Urchin like NiCo<sub>2</sub>O<sub>4</sub>/rGO nanocomposite for high energy asymmetric storage applications, *Ceramics International*, 46(10), (2020) 16291-16297. [I.F: 3.83] <https://doi.org/10.1016/j.ceramint.2020.03.186>
5. **Isacfranklin, M.**, Deepika, C., Ravi, G., Yuvakkumar, R., Velauthapillai, D. and Saravanakumar, B., Nickel, bismuth, and cobalt vanadium oxides for supercapacitor applications, *Ceramics International*, 46(18), (2020) 28206-28210. [I.F: 3.83] <https://doi.org/10.1016/j.ceramint.2020.07.320>
6. **Isacfranklin, M.**, Yuvakkumar, R., Ravi, G., Kumar, P., Hong, S.I., Babu, E.S., Velauthapillai, D., Almoallim, H.S. and Alharbi, S.A., Hybrid NiO-CoO nanocomposite for high energy supercapacitor applications, *Ceramics International*, 47(6), (2021) 8486-8489. [I.F: 3.83] <https://doi.org/10.1016/j.ceramint.2020.11.215>
7. **Isacfranklin, M.**, Yuvakkumar, R., Ravi, G., Babu, E.S., Velauthapillai, D., Thambidurai, M., Dang, C., Algarni, T.S. and Al-Mohaimed, A.M., Energy Storage Applications of CdMoO<sub>4</sub> Microspheres, *JOM*, (2021) 1-6. [I.F: 2.305] <https://doi.org/10.1007/s11837-020-04525-6>
8. **Isacfranklin, M.**, Rani, B.J., Ravi, G., Yuvakkumar, R., Hong, S.I., Velauthapillai, D. and Saravanakumar, B., Hydrothermal Method–Derived MnMoO<sub>4</sub> Crystals: Effect of Cationic Surfactant on Microstructures and Electrochemical Properties, *ChemistrySelect*, 5(26), (2020) 7728-7733. [I.F: 1.811] <https://doi.org/10.1002/slct.202001384>