

Poly(Vinyl Alcohol)/Poly(Acrylic Acid) Gel Polymer Electrolyte Modified with Multi-Walled Carbon Nanotubes and SiO₂ Nanospheres to Increase Rechargeability of Zn–Air Batteries

Lucía Díaz-Patiño ¹, Minerva Guerra-Balcázar ², Lorena Álvarez-Contreras ^{3,*} and Noé Arjona ^{1,*}

¹ Centro de Investigación y Desarrollo Tecnológico en Electroquímica, Sanfandila, Pedro Escobedo, Querétaro 76703, Mexico; apatino@cideteq.mx

² División de Investigación y Posgrado, Facultad de Ingeniería, Universidad Autónoma de Querétaro, Querétaro 76010, Mexico; minerva.guerra@uaq.mx

³ Centro de Investigación en Materiales Avanzados S.C., Complejo Industrial Chihuahua, Chihuahua 31136, Mexico

* Correspondence: lorena.alvarez@cimav.edu.mx (L.Á.-C.); wvelazquez@cideteq.mx (N.A.); Tel.: +52-614-439-1119 (L.Á.-C.); +52-442-211-6000 (ext. 7874) (N.A.)

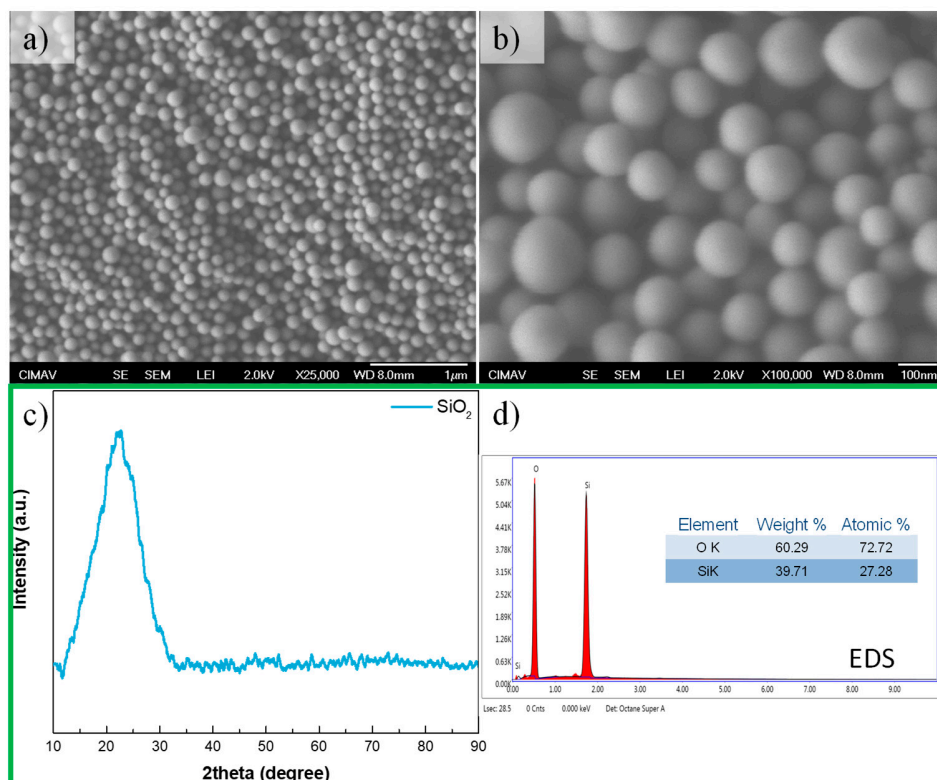


Figure S1. a, b) SEM micrographs of the synthesized SiO_2 nanoparticles, c) X-ray diffraction pattern and d) EDS analysis.

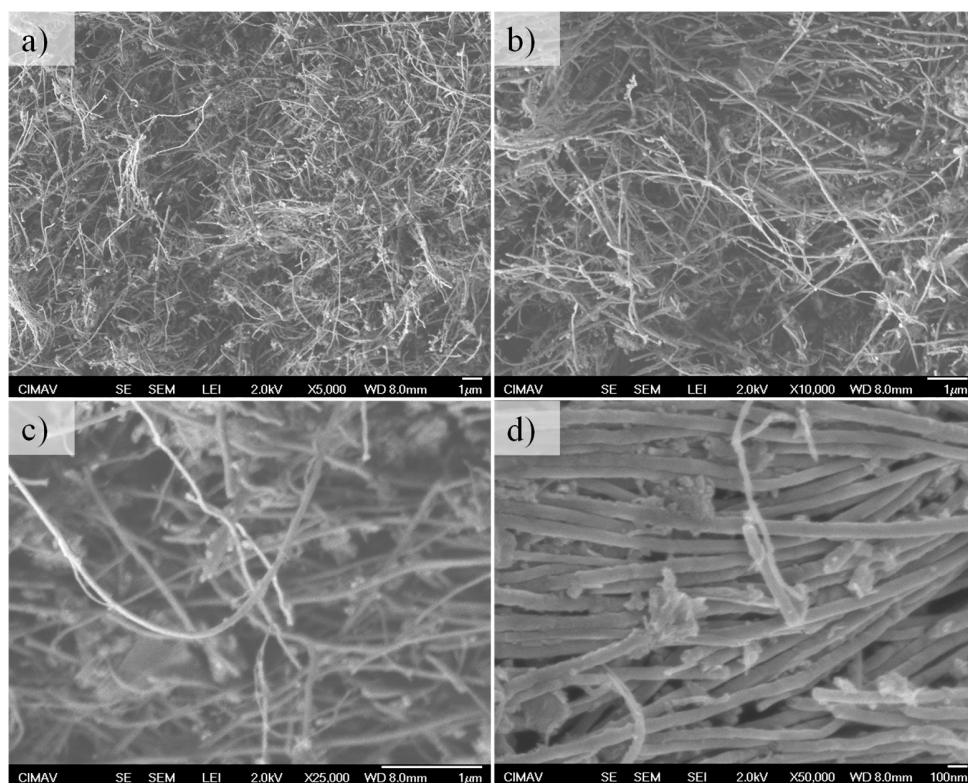


Figure S2. SEM micrographs of the synthesized multi-walled carbon nanotubes at different magnifications: a) 5000x, b) 10000x, c) 25000, and d) 50000x.

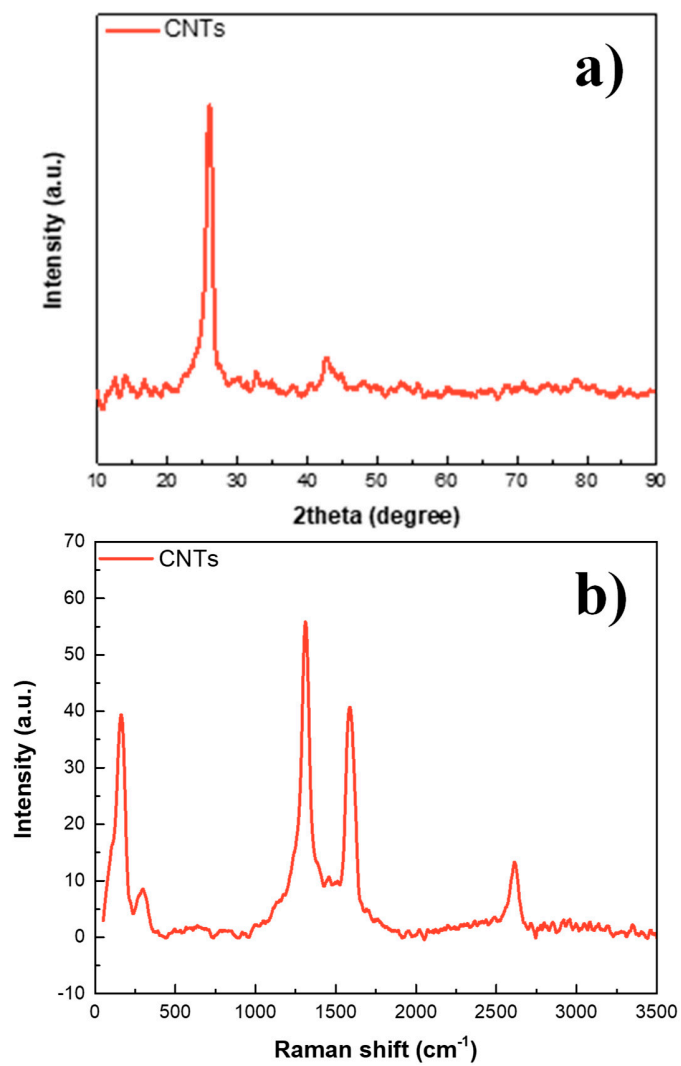


Figure S3. a) X-ray diffraction pattern and b) Raman spectrum of multi-walled carbon nanotubes.

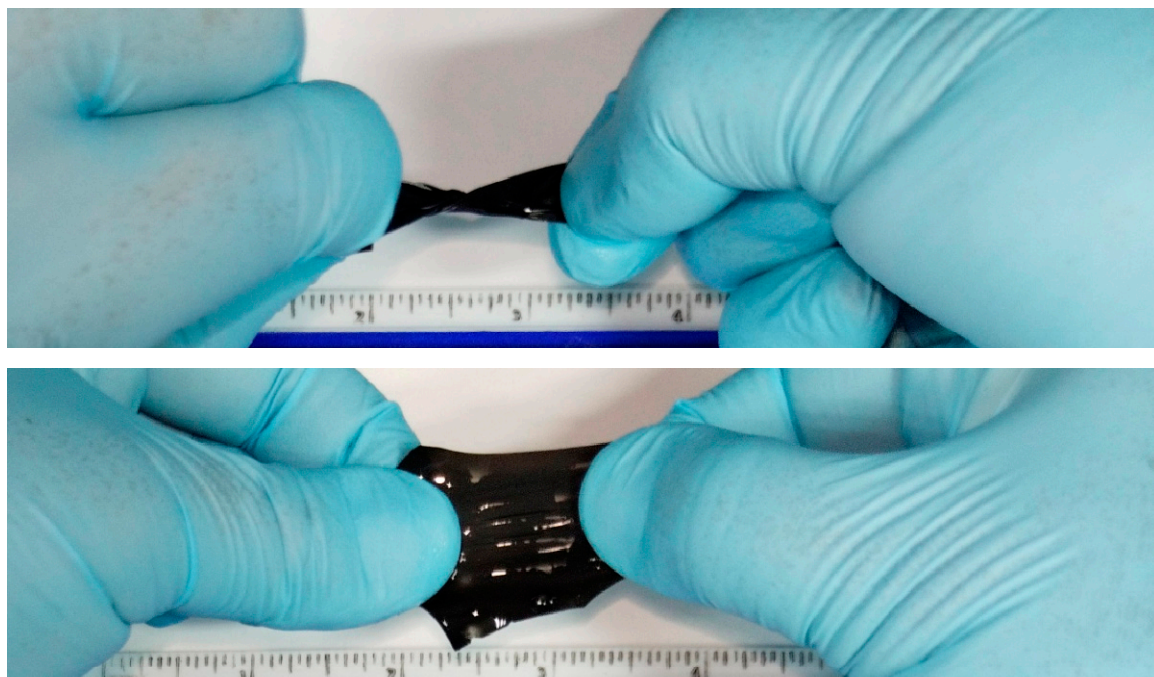


Figure S4. Photographs of the PVA/PAA-SiO₂-CNTs under different mechanical efforts