Novel ElectrospunBio-MOF / Polyaniline Nanocomposite for Flammable Gas Detection

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**Abstract.**Novel polyaniline (PANI)/bio-MOF hybrid nanomaterials were prepared successfully via sol-gel technique onto the polymerization process of PANI. The most proper synthetic nanohybrid was characterized using SEM, XRD, FTIR, and TGA. The optimum ratio was recorded using the first route to be 1 PANI: 1.5 Zr. The synthetic nanohybrid showed a crystalline structure with nanotube branching (like cauliflower) morphology. Electrospinning technique was used to fabricate a composite nanofiber matrix using polyvinyl alcohol (PVA) with the optimum prepared PANI/Zr nanocomposite. Electrospinning parameters including flow rate, collecting distance, and applied voltage were optimized to attain uniform composite nanofibers. The gas sensitivity of the synthetic nanofiber composite towards liquefied petroleum gas (LPG) as a function of temperature was specified by measuring the conductivity of two sputtered electrodes ofthe sensor’s devices. The nanofiber matrix showed the highest sensing performance for LPG within 10 sec at 200 ℃.

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