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Synthesis, Characterization and Application of $AlTiZrO_4$ Nanomaterial

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Abstract: *Oval shaped **$AlTiZrO_4$** nanoparticles were synthesized by wet chemical co precipitation and muffle ignition method. The oval shapes of nanomaterial were confirmed using SEM imaging and spinal packing in crystals were determined on the basis of XRD spectrum. The surface functionalities over nanomaterial was confirmed using FTIR spectrum elucidating hydroxyl and oxide groups over surface for future water wet ability. Furthermore the porous nature and electronic states in nanomaterial were elaborated on the basis of UV-Vis. And PL spectral transitions along with matching SEM and XRD data. The very high porosity of this ceramic nanomaterial was confirmed by BET measurements and future water remediation applications were demonstrated using antimicrobial testing on Proteus Vulgaris and membrane water purification activity. Overall this novel ceramic porous nano material has proved probable application in water purification membranes.*

Keywords: Oval ceramic, Nano material, Highly Porous, Water remediation, Absorbance

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