ARTICLE

Innovative hybrid biosorbent composed of nano ZnO and marine macro algae *Jania rubens* embedded in alginate/PVA matrix: Insights into Pb^{2+} removal in water

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Electronic Supplementary Information (ESI)

Table S1. Comparison of maximum metal uptake (q_m) for Pb^{2+} removal using different biosorbents.

Biosorbent	pH	q_m (mg g^{-1})	Ref.
Fe_3O_4 MNPs	5	30	[46]
Gracilaria changii	4.5	38.52	[32]
Ulva lactuca	5	54.3	[48]
C. fastigiata	5	16.11	[36]
S. gluacescens	5.5	35.53	[44]
C. indica	5.5	33.77	[44]
P. capillacea	5	34.1	[37]
J. rubens	5	30.6	[37]
J. rubens–PVA–SA	5	71.43	[4]
Magnetic alginate beads	7	50	[49]
ZnO–*JR–PVA–SA*	5	111.11	Present study

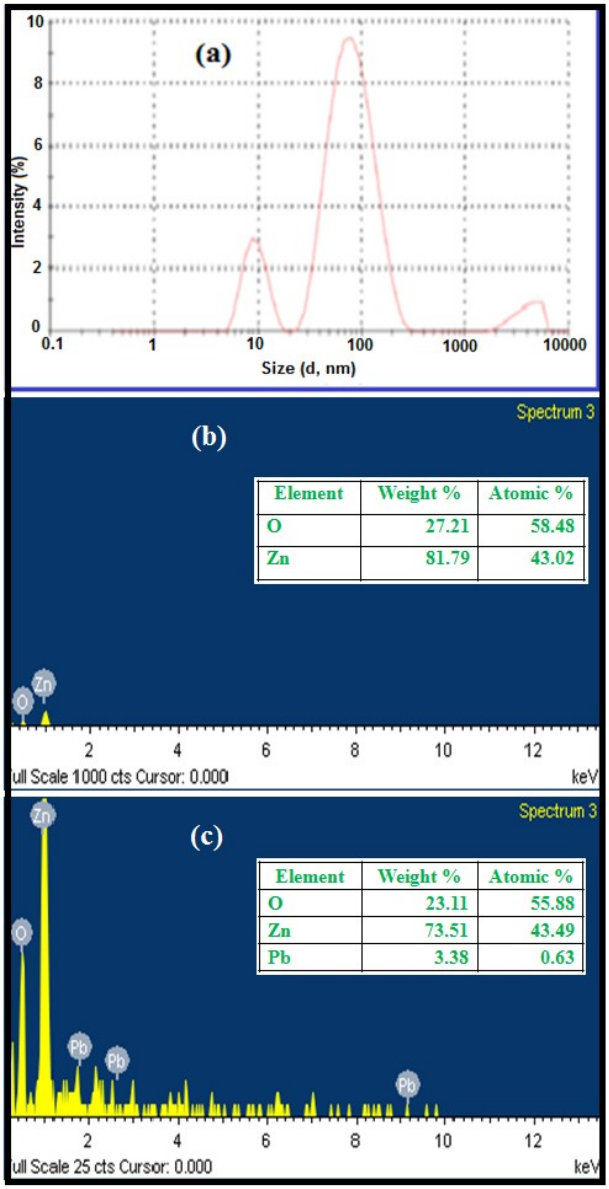

Figure S1. (a) Particle size distribution evaluated by DLS, and (b) EDX analysis of the hybrid biosorbent loaded with Pb^{2+}.

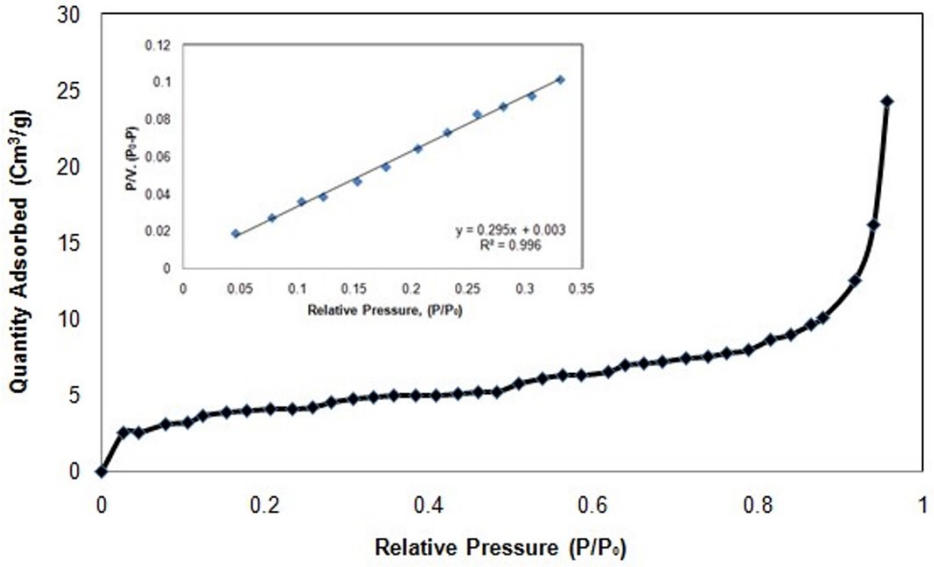

Figure S2. BET isotherm for evaluating the specific surface area of ZnO nanoparticles.

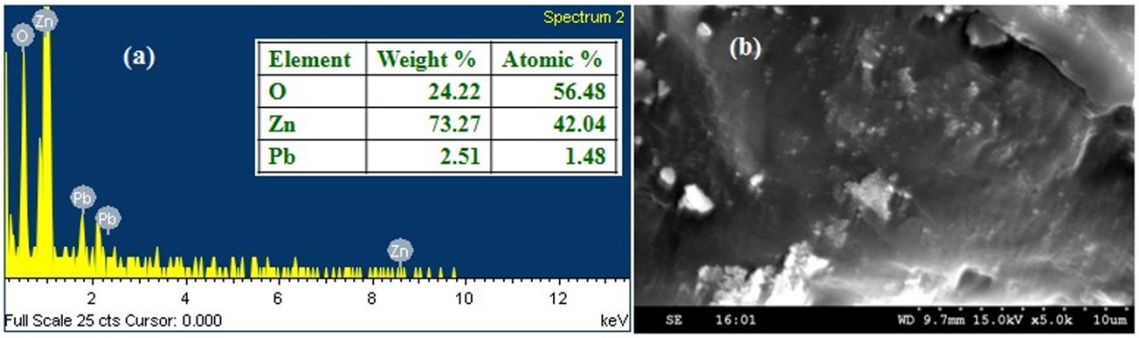

Figure S3. (a) EDX and (b) SEM images of hybrid biosorbent after 4 regeneration cycles.

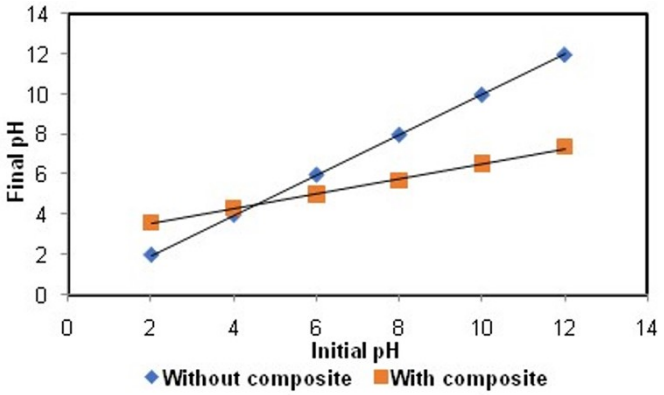

Figure S4. Measurement of PZC of ZnO nanoparticle using the pH drift method.