

Te-Ge-Se films: elaboration by thermal co-evaporation, characterization and use for the manufacture of IR integrated optics components, basic elements of CO₂ optical microsensors

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Films in a wide range of compositions in the Te-Ge-Se ternary system were prepared by thermal co-evaporation. The evolution of optical and thermal properties versus the composition have been used to determine a particular area of composition which is interesting for manufacturing waveguides being able to operate from 1 to about 17 microns.

Straight and curved RIB waveguides as well as Y-junctions based on these compositions were fabricated by using laser lithography and ion beam etching. Propagation losses of straight RIB waveguides were estimated to be around 1 dB.cm⁻¹ at $\lambda=1.55 \mu\text{m}$. All the curved RIB waveguides were highlighted to be operational, independently of their curve radius and angle. Finally, the Y-junctions were shown to operate at a satisfying power division.

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Removal of Ni by activated carbon produced from Egyptian rice straw by chemical activation

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The present work explored the use of Egyptian rice straw, an agriculture waste that lead to a global warming problem through brown cloud, as a potential feedstock for the preparation of activated carbon with high surface area by chemical activation. Chemical activation of this precursor, using two different methods was adopted. One of these methods was carried out using H₂SO₄ for carbonization while activation carried out using KOH and the other method include activation using KMNO₄. The produced activated carbon was fully characterized considering its adsorption properties (surface area and pore volumes) as well as its chemical structure and morphology. Application of using the produced activated carbon and raw rice straw for removal of Ni was evaluated in a batch operation system. Studying of the operating conditions namely; effects of contact time, dosage of adsorbent, initial concentration as well as effect of pH were carried out. Also kinetics and isotherm study that describe the adsorption process are carried out.

Biography

Marwa Abdel Fattah received her Ph.D. in Chemical engineering from Alexandria University, Alexandria, Egypt in 2012. She has completed her M.Sc. and B.Sc. from Alexandria University, Alexandria, Egypt. She is currently working as an Assistant Professor at Pharos University. Her research interests involve production of biodiesel and synthesis of new materials and their applications as adsorbents in industrial waste water treatments. She has published 2 papers from her Ph.D. thesis and she published 3 papers in reputed journals and serving as an editorial board member and reviewers for reputed journals.

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