Contribution ID: **258** Type: **Oral Presentation**

Nickel substituted Spinel-type zinc ferrite nanostructures prepared by microwave-assisted hydrothermal and their structural, luminiscence and gas sensing properties.

Thursday, 11 July 2019 11:20 (20 minutes)

Various volatile organic compound (VOCs) gases are released from a wide range of products commonly found in buildings resulting in indoor environmental pollution thus posing risks to human health. Much attention has been dedicated on development of spinel-type ferrites as gas sensors for detection of VOCs gases and environmental monitoring. However, the growing demand of highly responsive, selective and stable sensors still persists with the ever growing industrialization. In this work, NixZn1-xFe2O4 (x = 0, 0.1, 0.3, 0.4) nanostructures were facilely prepared using microwave-assisted hydrothermal technique followed by annealing at 500 ℃. The effect of Ni substitution on the structural and optical properties as well as specific surface area was investigated through various characterization techniques including scanning electron microscopy (SEM), transmission electron microscopy (TEM), X-ray diffraction (XRD), Brunauer–Emmett–Teller method, and Photoluminescence (PL) spectroscopy. Gas sensing performances of the ZnFe2O4 nanostructures were investigated for Acetone (C3H6O), Ethanol (C2H6O) methane (CH4), carbon monoxide (CO), ammonia (NH3) and hydrogen (H2) gases at an optimized operating temperature of 120 ℃.

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

MSc

Primary author: Mr NEMUFULWI, Murendeni (CSIR/UFS)

Co-authors: Prof. MHLONGO, Gugu (CSIR/UFS); Prof. SWART, Hendrick (UFS)

Presenter: Mr NEMUFULWI, Murendeni (CSIR/UFS)

Session Classification: Applied Physics

Track Classification: Track F - Applied Physics