Electrical properties of the Yb/Ga_2S_3 interface

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Abstract

Ga_2S_3 thin films are deposited onto Ytterbium substrate at vacuum pressure of 10^{-5} mbar for use as new class of optoelectronic devices. The Yb/Ga_2S_3 interface is studied by means of current- voltage characteristics, impedance spectroscopy in the frequency range of 1.0 M-1.8 GHz and the power spectroscopy in the frequency range of 1.0 M-3.0 GHz. The studies allowed determining the current conduction mechanism at the interface, the capacitive and inductive reactance, the resonance -antiresonance spectral positions, the inductive region width as well as the notch frequency of wave filtering. The resulting values and behaviors of the frequency dependent parameters indicated that the Yb/Ga_2S_3 heterojunction are promising interface for use as band stop filters and wave traps. These filters are also observed to be tunable through voltage biasing indicating the applicability of the devices as voltage linear oscillator.

Keywords: Interface; wavetrap; band stop filter; InSe