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Spinel ferrite oxide semiconductor gas sensors

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Abstract

The demand for portable gas sensors is increasing following the progress in the electronics industry; there is an equal need to increase the quality of gas sensors. Spinel ferrites have been used as electronic materials for more than 50 years and offer a suitable ceramic base for the gas sensor market. They are simple, low cost, and compared to other gas sensors have structural and compositional versatility. This review highlights the recent developments and shows the potential of the spinel ferrites on gas sensor technology. Sensing mechanisms for a range of gasses and humidity are explained for n-type, p-type, mixed and substituted spinel ferrite gas sensors. The change in conduction mechanism is discussed outlining electronic and chemical sensitization that both increase the conductivity. Some cation substitutions are shown to change the oxidation state, thereby increasing sensitivity, but noble metals are shown to chemically sensitize spinel ferrites. This review surveys synthesis methods for producing spinel ferrites and discusses future prospects for further improvements.

Keywords: ferrite, gas sensor, nanomaterials

Contents:

1. Introduction
2. Cation site occupation in the spinel ferrite structure

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