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The use of X-ray analysis to identify optimum micro-strain to improve the ionic conductivity of $CsAg_{2-2x}Ti_xI_3$(x=0-0.4)

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The superionic conductor materials often have rather special structure in that there are open tunnels or layers through which the mobile ions can move. AgI is the most prominent superionic conductor which has the highest ionic conductivity in its α-phase that is stable above 420 K.

This paper is a part of our investigations on the effect of silver ion substitution by cations of different size on microstructure and ionic conductivity of the compound $CsAg_2I_3$. This attempt is to find out the suitable structure in order to improve the ionic mobility. Here, the divalent cation Ti+2is selected to replace silver ion in this compound. The X-ray diffraction data of the samples have been analyzed using Willamson-Hall method. The peaks of X-ray profile have been determined with more accuracy using PeakFit program. The results say that the lattice strain increases with increasing of Ti^{+2} cationcontents. As well as, the ionic conductivity enhances due to the increase in the lattice strain. Unit cell parameters have been also refined and obtained using Chekcell software.

Biography

Samir Osman Mohammed has completed his Ph.D. at the age of 37 years from Mysore University. He is the head of curriculum committee in applied physics program, a member of International Center of Powder Diffraction. He has published several papers in reputed journals and serving as faculty member of physics department at Ibb University, Yemen.

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Calculation and simulation of loads applied to the structure of a rollover carwash machine

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According to the International Carwash Association (ICA), carwash is an industry of 45 billion dollars employing 500,000 people only in North America and therefore safety of workers, customers and vehicles is of great importance in this industry. However, a simple study reveals that hardly any study has been carried out on the internal loads and behavior of these machines. In this study, which has been carried out in collaboration with a local company, initially the main loads applied to the rollover were identified and quantified. The behavior of the structure was then simulated in Solidworks to identify the location and distribution of stress while these loads are applied in static mode. Then according to observations and interviews with carwash expertise and owners, the potential hazards or risks which are likely to happen were identified and simulated in dynamic mode as: a) Obstruction of one column while the other one is still moving. b) Reaction force of brushes. The results indicate that the structure is sufficiently capable of withstanding static loads, however, in case of obstruction; stress concentration in certain locations may reach considerable local stress resulting in deformation, derailment of the machine or other hazards.

Biography

Seyyed M.M. Sabet is doing his Ph.D. in University of Minho in Engineering Design and anufacturing theme of MIT Portugal Program in collaboration with a local company on development of a new carwash machine. He obtained his M.Sc. in Materials Science and has published 5 journal and conference papers on composites and fibers.

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