Magnetic and M??ssbauer studies of Fe/V multilayers

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Abstract: The structural and magnetic properties of rf-sputtered Fe/V multilayers with the elemental Fe and V layer thickness $t_{Fe} = t_V$ and with the structural modulation period A ranging from 2 nm to 24 nm have been studied by high-angle x-ray diffraction, vibrating-sample magnetometry and conversion-electron M??ssbauer spectrometry methods at room temperature. The results show that the Fe/V interfaces are paramagnetic. The magnetic behaviour of the multilayers, hence, originates from the ?-Fe at the centres of the individual subsystems and the iron-rich crystalline Fe(V) alloy lying near the interface. The spin orientation in the Fe layers is strongly aligned in the film plane. However, evidence for a weak perpendicular spin orientation associated with the magnetic topmost Fe layer is found.

Year: 1998
Source title: Journal of Physics Condensed Matter
Volume: 10
Issue: 26
Page : 5791-5797
Cited by: 5
Link: Scorpus Link
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ISSN: 9538984
CODEN: JCOME
DOI: 10.1088/0953-8984/10/26/007
Language of Original Document: English
Abbreviated Source Title: Journal of Physics Condensed Matter
Document Type: Article
Source: Scopus
Authors with affiliations:

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