

JETP Letters 2004 vol.80 N1, pages 44-48

The proximity effect in an Fe-Cr-V-Cr-Fe system

Garifullin I., Tikhonov D., Garif'yanov N., Fattakhov M., Tagirov L., Theiz-Bröhl K., Westerholt K., Zabel H.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The proximity effect was studied in a thin-film Fe-Cr-V-Cr-Fe layered system. As the chromium layer thickness ($d(\text{Cr})$) increases at a fixed thickness of iron layers ($d(\text{Fe})$), the dependence of the superconducting transition temperature ($T(c)$) on $d(\text{Cr})$ exhibits a maximum at $d(\text{Cr}) \approx 40 \text{ \AA}$ followed by a sharp decrease. Investigation of the dependence of $T(c)$ on $d(\text{Fe})$ at a fixed $d(\text{Cr})$ showed that the depth of penetration of the Cooper pairs into a chromium layer does not exceed 40 \AA . Analysis of the results obtained suggests that, at $d(\text{Cr}) \approx 40 \text{ \AA}$, chromium layers exhibit the transition from a nonmagnetic state to an incommensurate spin density wave state. © 2004 MAIK "Nauka/Interperiodica".

<http://dx.doi.org/10.1134/1.1800213>
