POINT-CONTACT SPECTROSCOPY OF $Ce_{1-x}RE_xNi_5$ (RE = Pr, Nd)

T. Kačmárová[a], M. Reiffers[b], J. Garcia Soldevilla[c], J.C. Goméz Sal[c], J.I. Espeso[c] and J.A. Blanco[d]

[a]Faculty of Sciences, University of P.J. Šafárik, Park Angelinum 9, SK-041 54 Košice, Slovakia

[b]Institute of Experimental Physics, Watsonova 47, SK-043 53 Košice, Slovakia

[c]CITYMAC, Facultad de Ciencias, Universidad de Cantabria, 39005 Santander, Spain

[d]Departamento de Fisica, Universidad de Oviedo, E-33007 Oviedo, Spain

9.7 cm

We report on the study of the modification of the electron-quasiparticle interaction (EQI) function in $Ce_{1-x}RE_xNi_5$ (RE = Pr, Nd) pseudobinary compounds for $x = 0, 0.2, 0.5, 0.8$ and 1 by point-contact (PC) spectroscopy. $CeNi_5$ is the Stoner enhanced paramagnet which is characteristic by the influence of spin fluctuation on its properties. On the other hand, $PrNi_5$ is van Vleck paramagnet and $NdNi_5$ is the ferromagnetic compound both with crystalline electric field (CEF) influence on their properties. The measured PC spectra (d^2V/dI^2 - directly proportional to the EQI function) of the heterocontacts between $Ce_{1-x}RE_xNi_5$ and Cu in ballistic regime above and below T_C are presented. The intensity of spin fluctuation peak at ~ 2.5 meV in $CeNi_5$ is decreasing with increasing Nd content and it vanishes for $x = 0.5$. The CEF peaks from Nd ions are arising at $x = 0.5$ in magnetically ordered state. The main CEF peak from Pr ions appear already for $x = 0.2$. Its position is shifted to lower energy and it reaches finally 4 meV in $PrNi_5$. The spin fluctuation peak at ~ 2.5 meV disappears for $x = 0.5$.

13.4 cm

Subject category :

4. Rare Earths and Actinides, Alloys and Compounds

Presentation mode :
poster

Corresponding author :
T. Kačmárová

Address for correspondence :
Faculty of Sciences
University of P.J.Šafárik
Park Angelinum 9
SK-041 54 Košice
Slovakia

Email address :
salonova@kosice.upjs.sk