

## First results from electron emission channeling on-line experiments

*Tuesday 18 December 2007 11:30 (15 minutes)*

This talk reports on the results from the first electron emission channeling on-line run of the ECSLI collaboration, which took place during this year's Mn beam time in June. Using our new on-line setup which is equipped with a position-sensitive Si pad detector with fast readout system and which was mounted on the LA2 beam line, two isotopes were successfully used for beta- emission channeling experiments for the first time:  $^{56}\text{Mn}$  (2.58 h) and  $^{61}\text{Co}$ . While  $^{56}\text{Mn}$  was available directly,  $^{61}\text{Co}$  was obtained by means of implanting the short-lived precursor isotope  $^{61}\text{Mn}$  and exploiting the decay chain  $^{61}\text{Mn}$  (4.6 s)  $\rightarrow$   $^{61}\text{Fe}$  (6 min)  $\rightarrow$   $^{61}\text{Co}$  (1.6 h). We were thus able to determine the lattice location of Mn in GaN and of Co in ZnO in the as-implanted state and following annealing up to 900°C. In both cases it was found that the transition metals preferred substitutional cation (i.e. Ga or Zn) sites.

In order to explore the feasibility of using the isotope  $^{27}\text{Mg}$  for lattice location experiments, we also did a brief test of the decay chain  $^{27}\text{Na}$  (295 ms)  $\rightarrow$   $^{27}\text{Mg}$  (4.6 s). However, in this case it was found that the ISOLDE beam consisted mainly of stable  $^{27}\text{Al}$ , making emission channeling experiments using this isotope from UC-W surface ionization targets not feasible.

**Author:** Dr WAHL, Ulrich (Instituto Tecnológico e Nuclear ITN)

**Co-authors:** Mrs MARQUES, Ana Claudia (Centro de Física Nuclear da Universidade de Lisboa and CERN); Mr MARQUES, Carlos Pedro (Instituto Tecnológico e Nuclear ITN); Dr CORREIA, João Guilherme (Instituto Tecnológico e Nuclear ITN); Mr PEREIRA, Lino (Faculdade de Ciências, Universidade do Porto); Prof. RIBEIRO DA SILVA, Manuel (Instituto Superior Técnico and Centro de Física Nuclear da Universidade de Lisboa); Mr DECOSTER, Stefan (Instuut voor Kern- en Stralingsfysica Leuven); Mr KANA, Tomas (Instuut voor Kern- en Stralingsfysica)

**Presenter:** Dr WAHL, Ulrich (Instituto Tecnológico e Nuclear ITN)

**Session Classification:** Solid State Physics