Conversion-electron spectroscopy to study shape coexistence in medium-mass N=Z nuclei

Andreas Görgen DAPNIA/SPhN CEA-Saclay

Workshop on Future Conversion-Electron Spectroscopy in Europe Bonn, Jan. 23-24, 2003



M.-Yamagami, K. Matsuyanagi, M. Matsuo, Nucl. Phys. A693, 579 (2001)







Delayed electron spectroscopy after fragmentation







 \Rightarrow No sign of EO transition in ⁶⁸Se







should have been observed at GANIL



By the time the recoil is implanted, the second 0^+ has decayed via γ branch.





What we need is:

□ channel identification : essential !

 $\hfill \Box$ high γ efficiency for gating

□ conversion-electron spectrometer



possible set-up at I ReS Strasbourg (May/June 2003 ?)

- keep the Clovers a little longer
- n-wall will be set up anyway (hopefully)
- replace the Clusters (then at GSI) with ICEMOS



- Electronics/DAQ system ?
- mechanical support structure ?
- manpower ?
- other experiments ?
- timing for a campaign ?
- •...?

reactions:

 ^{40}Ca ($^{36}Ar,\,2\alpha$) ^{68}Se : no Ar beam at the VI VI TRON ! difficult to detect charged particles and electrons

⁵⁸Ni(¹²C, 2n)⁶⁸Se: }

both possible

Channel I dentification with Neutron Wall



in favor of reaction in inverse kinematics:

¹²C (⁵⁸Ni, 2n) ⁶⁸Se

Mini-Orange Spectrometer (MOS)



1200

Energy (keV)



Large angular acceptance of MOS causes Doppler broadening !

 ^{58}Ni ($^{12}\text{C},\,2n$) ^{68}Se \rightarrow v/c = 1.5 % \rightarrow resolution ~ 9 keV @ 600 keV

diaphragm improves resolution: ~ 6 keV @ 600 keV reduces transmission by ~ 25 %



Summary:

⁵⁸Ni (¹²C, 2n) ⁶⁸Se



at Strasbourg !

Neutron Wall : $\varepsilon \sim 20 \%$

 \Box 26 Clovers : ϵ = 3.8 %

3 MOS : ε ~ 6 %

It is feasible to study shape isomers in the A=70 region with such a set-up.

Shall we push for a campaign with the Clovers, ICEMOS, n-wall and/or RFD at I ReS?