

DRAGON 26gAl(p,g)27Si Run Plan - June 2004

26Mg Beam expected Monday June 14th, A.M.
 26Al Beam expected Friday June 18th, P.M.

Preparations before run:

1. NaI scintillators will have been installed at mass slit box with the new "Unicorn Horn" positron collector assembly. This will have to be calibrated for efficiency using a known intensity beta+ source, probably ^{22}Na (open source). Annihilation 511 keV gamma rays produced when the betas hit the Horn will be detected in coincidence by the two scintillators. An SCA unit will be gated so as to only collect the 511 keV peak events. These will be input into a scaler and collected into the data stream. Scaler spectra in PAW for this would be useful.
2. The HPGe 30% detector given to us by LTNO will be set up at the port on the west side of the mass slit box, slightly upstream of the slits. This too will have to be calibrated with an appropriate source. The intention here is to collect an ADC spectrum looking for a peak at 1809 keV (from the decay of ^{26}Na). A threshold can be set to lower the rate for this detector.
3. New MCP foils will be prepared and inserted into the holder in the final slit box. CV, MA and CR have been shown by ML how to prepare these foils in the chemistry lab on the second floor of the ISAC target building.
4. New 130 $\mu\text{g}/\text{cm}^2$ mylar windows will have been prepared, and one fitted to the IC prior to initial beamtime. German 55 $\mu\text{g}/\text{cm}^2$ windows will be on standby for the low energy run.
5. The MCP will be used as the H-Trigger this time round. It is important that this is tested under appropriate conditions prior to the run.

MAIN OBJECTIVES:

1. Measure contamination components in A=26 beam
2. Take more data on 363 keV resonance in $^{26}\text{gAl}(p,g)^{27}\text{Si}$
3. Establish separation capabilities of IC
4. Tune to sit on 188 keV resonance
5. Look for ^{27}Si coincidences

Schedule:

Mon 14th June - Tue 15th June: 26Mg 1050 keV/u

The aim of this Monday and Tuesday owl shift session will be to measure charge state distributions for Mg at this high energy appropriate to the $^{21}\text{Na}(p,g)^{22}\text{Mg}$ study. This will also be used as an opportunity for recent arrivals to train in the preparation and use of the separator. ISAC operators will tune to 384 keV/u during the owl shift if satisfactory data have been taken at 1050 keV/u by that time.

Tue 15th June - Thu 17th June

Due to the double maintenance day, we may not see accelerated beam in this period as yield measurements have to be made by M. Dombosky. However, should the opportunity arise, we should be ready to take beam at short notice.

Fri 18th June: 26Mg 384 keV/u

This day should be spent establishing a good tune through both the DRAGON

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target (ie. good angle, position and beamspot size) and the separator (100% transmission through to FCF). A short run of attenuated beam into the IC would be useful as a consistency check against the previous run.

Sat 19th June - Tue 22nd June: 26Al 384 keV/u

Attenuate 26Al beam using same method as before: ask ISAC to close slits to get a factor 1000 reduction. Turn off Q1 and Q2 and close down charge slits until acceptable rate seen on MCP trigger. Take run of attenuated beam into IC. With decent statistics we should be able to put constraints on amount of 26Mg in the beam.

Scale to 27Si recoils. Gas target 8 Torr. IC 8 Torr. Take on-resonance run for long time, enough to see 26Na peak at 1809 keV in HPGe spectrum, and to collect substantial scaler data from the NaI scintillators. This data will tell us how much 26Na and 26MAl are in the beam.

If the above are satisfactorily completed, should ask for an energy change to off-resonance (364 keV/u for example), and take a longish run tuned for recoils.

Tue 22nd June - Wed 23rd June: Maintenance days

IC window should be changed for German 55 ug/cm**2 one
ISAC will be tuned for 205 keV/u (188 keV resonance = 195 keV/u, ~10 keV/u lost in half target, so 205 keV/u), not 175 keV/u as in ISAC beam scheduling.

Wed 23rd June, P.M: 26Mg 205 keV/u

After checking beam properties, should first run with attenuated beam into IC. This will check that the anode region where the beam stops is as predicted. Charge state distribution.

Thu 24th June:

A.M. Yield measurements

P.M. 26Al 205 keV/u attenuated beam run, then tune for recoils

Fri 25th June:

A.M. Yield measurements

P.M. 26gAl(p,g)27Si tuned for recoils, looking for coincidence data

Sat 26th June - Wed 30th June Owl shift: 26Al 205 keV/u

Most of this time should be spent looking for recoil events from the 26gAl(p,g)27Si reaction.

CHRIS RUIZ
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