

# Liquid Surface X-ray Scattering User Help

## Detectors

### Ion Chamber Detectors

#### Ion chamber setup

(esp. monc, the beam normalization detector on the Incident Arm)

- 1) Preamp Offset: Keep dark count (no beam) lower than 100
- 2) Preamp Sensitivity: Select gain so the count rate is  $>5000$  counts/second and  $<500,000$  counts/second (to keep the error  $<2\%$ )
- 3) Use  $N_2$  for photon Energy between 8-30keV. Check  $N_2$  supply everyday (or Ion chamber's count is wrong)
- 4) Ion chamber high voltage: For photon energies less than 25keV use a voltage of 2 kV. For higher energies, use 1.5 kV

#### How to calculate absolute current output from ion chamber

Ratemeter (if set to "1x") gives an output of 100,000 cts/s for every volt out of preamp. The preamp converts current from the ion chamber to a voltage.

(high sensitivity;  $5\text{nA/V} \Rightarrow$  only 5 nA required to produce 1 volt output.

Low sensitivity;  $5\text{ microA/V} \Rightarrow$  a much larger current required to make same 1 volt output)

For example:

2,300,000 cts/s gives 2.3 volts. If the preamp sensitivity is set to 5 microamps/volt, this means that 11.5 microamps are produced by the

### Scintillator Detector (Cyberstar 1000)

- Use MCA to check the window, gain and HV settings
- Check linear range
- Check hutch noise (put lead tape in front of S2 with beam on)