Technical note 12406 Alignment of Platform Three-circle X-ray Diffractometer

General suggestion

Always do this as a team. One person performs the alignment and one person monitor the actions of the first person.

1.) Turn off X-rays
2.) Move detector back
3.) Move LT out of the way
4.) Remove beam stop
5.) Place PIN diode on collimator and secure with black tape
6.) Plug PIN diode powder supply into the outlet
7.) Plug the dual plug into multi-meter
8.) Turn dial on multi-meter to 200mv DC volts (meter will read 0.0)
9.) Place Radiation meter below collimator on platform and turn on
10.) With the service key override the safety interlocks
11.) Turn X-rays on move X-ray generator Key to 2nd position
12.) Bring X-rays to 40 kV and 40mA
13.) On the SMART or APEX instrument: start SMART (or APEX)
14.) Shut the X-ray enclosure doors
15.) Open safety shutter
    a. On D8 push and hold red shutter button on shutter control box (just below the doors)
    b. On SMART1000 push the shutter open button on shutter control box (this is the reset button in normal mode)
16.) Safety shutter will now open
17.) Check for stray X-rays
    a. GM meter should be silent (except for normal background radiation)
18.) On the SMART or APEX: toggle rotary shutter with SMART (or APEX)
19.) The GM meter should read a positive MV reading
    a. (negative if dual plug is plugged in wrong)
    For a new X-ray tube and a 0.5mm collimator (only front pinhole in)

Mo Ceramic Tube	40kV/40ma	143 mV
Mo Glass Tube	40kV/40ma	120 mV
Cu Ceramic Tube	40kV/40ma	90 mV
Cu Glass Tube	40kV/40ma	50 mV

20.) Check for stray X-rays
    a. If no stray radiation is seen then it is safe to open the enclosure doors
        i. Only one person should have their hands inside the enclosure box!
        ii. Only put your hands and arms into the enclosure box!
        iii. Work quickly but safely
21.) Use a second GM to measure around the tube and monochromator
    a. Do a through sweep of the area to measure for stray radiation
    b. Never assume that it is safe!
22.) If no stray radiation is detected then you may begin.