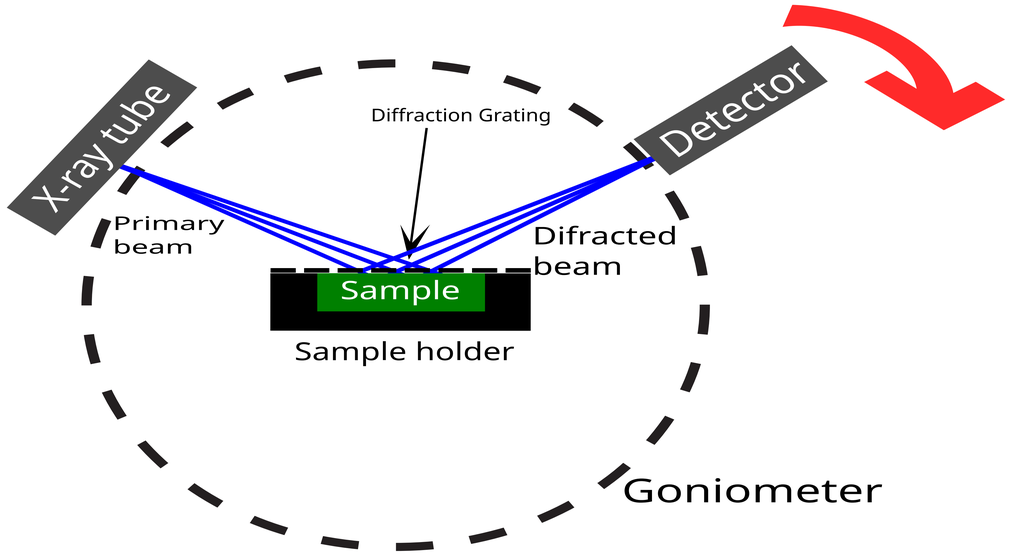
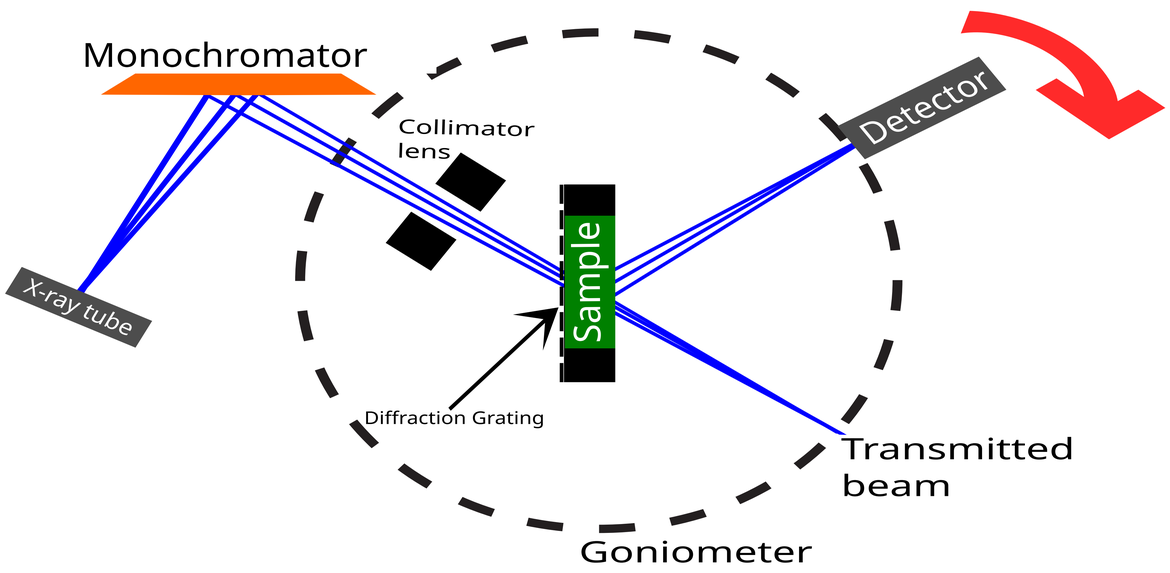
X-Ray Diffractometer

i.) Classic reflection geometric mode.



ii.) Transmission geometric mode.



Parts of the system

- **X-ray source:** produces a beam of X-rays that are directed towards the sample
- **Sample:** the material being analyzed
- **Detector:** measures the intensity and angle of the diffracted X-rays
- **Monochromator:** filters out unwanted wavelengths of X-rays
- **Goniometer:** rotates the sample and detector to measure diffraction at different angles
- **Collimator lens:** limits the size of the X-ray beam to only pass through the sample

Functioning of the system

- In both modes, the diffraction grating diffracts the light beam into its component wavelengths, which are then analyzed by the detector and data analysis system to determine the properties of the sample.

- The main difference is in how the light beam interacts with the sample, in reflection mode the light is reflected from the surface of the sample and in transmission mode the light beam is sent through the sample.