

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Lecture 21 : Size of Euler Space in Relation to Crystal and Sample Symmetry

Lecture 22 : Macrotecture and Microtexture Measurements

Lecture 23 : Penetration Depth of X-ray, Neutron, e-1 and Basics of X-ray Generation

Lecture 24 : Characteristic X-ray, Absorption and Filters

Lecture 25 : Principles of pole figure measurements by X-ray diffraction

Week 5 Lecture Material

Quiz: Week 5 : Assignment 5

Week 5 Feedback Form

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Week 12

Download Videos

Assignment Solution

Live Interactive session

Week 5 : Assignment 5

The due date for submitting this assignment has passed.

Due on 2021-09-01, 23:59 IST.

As per our records you have not submitted this assignment.

1) Which of the following radiation have the highest depth of penetration

1 point

- (a) x-rays
 (b) neutron
 (c) electron
 (d) all are equal

No, the answer is incorrect.
Score: 0
Accepted Answers:

(b) neutron

2) Macrotecture is measured by:

1 point

- (a) X-ray diffraction;
 (b) Electron backscattered diffraction;
 (c) Neutron diffraction;
 (d) Transmission electron microscopy.

No, the answer is incorrect.
Score: 0
Accepted Answers:

 (a) X-ray diffraction;
 (c) Neutron diffraction;

3) Which of the following can be directly measured by experiment:

1 point

- (a) pole figure
 (b) inverse pole figure
 (c) orientation distribution function
 (d) all the above

No, the answer is incorrect.
Score: 0
Accepted Answers:

(a) pole figure

4) Microtexture can be measured by:

1 point

- (a) X-ray diffraction;
 (b) Electron backscattered diffraction;
 (c) Neutron diffraction;
 (d) Optical microscopy.

No, the answer is incorrect.
Score: 0
Accepted Answers:

(b) Electron backscattered diffraction;

5) Mass absorption coefficient of a certain radiation depends on:

1 point

- (a) Wavelength of the radiation
 (b) the interaction type of the radiation with atoms
 (c) Thickness of the specimen
 (d) Density of the specimen

No, the answer is incorrect.
Score: 0
Accepted Answers:

(a) Wavelength of the radiation

(b) the interaction type of the radiation with atoms

(d) Density of the specimen

 6) **Characteristic x-ray radiation is produced when:**

1 point

- (a) $e^{-1}s$ with sufficient energy interacts with conduction and valence band $e^{-1}s$ of the target metal
 (b) $e^{-1}s$ with sufficient energy interacts with nucleus of the atoms in the target metal
 (c) $e^{-1}s$ with sufficient energy knocks down $e^{-1}s$ from the valence band in the target metal
 (d) $e^{-1}s$ with sufficient energy knocks down $e^{-1}s$ from the inner shells in the target metal

- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers:

d

7) The pole figure represents:

1 point

- (a) Crystal orientation with respect to sample reference frame
 (b) Sample orientation with respect to the crystal reference frame
 (c) Crystal orientation with respect to standard stereographic projection
 (d) Crystal orientation in a stereographic triangle

No, the answer is incorrect.
Score: 0
Accepted Answers:

(a) Crystal orientation with respect to sample reference frame

 8) **The condition/s required to be satisfied for the Schulz refraction method:**

1 point

- (a) A divergent incident and convergent diffracted x-ray beam.
 (b) Bragg- Brentano focussing condition.
 (c) ϕ angle rotation about sample axis and χ angle tilting about an important sample direction.
 (d) In plane translational motion of sample for statistical averaging.

- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers:

a

b

c

d

 9) **Which of the following sentences are true:**

1 point

- (a) For triclinic symmetry, the periodicity of Euler space, $\varphi_1, \phi, \varphi_2$ is $0^\circ - 360^\circ, 0^\circ - 360^\circ, 0^\circ - 360^\circ$ respectively.
 (b) The sample symmetry or deformation symmetry only affects φ_1 .
 (c) Presence of a single n –fold rotational symmetry in the crystal structure reduces the φ_2 to $0^\circ - \frac{360^\circ}{n}$.
 (d) Presence of another mirror symmetry in the crystal structure reduces the ϕ to $0^\circ - 180^\circ$.

- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers:

b

c

10) In X-ray texture measurement the specimen is subjected to tilting and rotation to:

1 point

- (a) bring all grains near the surface in diffraction condition.
 (b) impose the sample reference directions on the pole figure.
 (c) increase the statistics of measurement.
 (d) none of the above.

No, the answer is incorrect.
Score: 0
Accepted Answers:

(a) bring all grains near the surface in diffraction condition.