

## Course outline

How does an NPTEL online course work?

Week 0

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Week 12

- Lecture 54 : Static recrystallization

- Lecture 55 : Dynamic recrystallization and recrystallization texture

- Lecture 56 : Dynamic recrystallization and grain refinement during hot large strain shear deformation in Mg alloy

- Week 12 Lecture Material

- Quiz: Week 12 : Assignment 12

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# Week 12 : Assignment 12

The due date for submitting this assignment has passed.

**Due on 2021-10-20, 23:59 IST.**

As per our records you have not submitted this assignment.

 1) Recrystallization of cold worked material leads to: 1 point

- (a) Increase in grain boundary
- (b) Increase in strength and hardness
- (c) Decrease in grain boundary
- (d) Decrease in strength and hardness

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) Increase in grain boundary  
(d) Decrease in strength and hardness

 2) Cell and subgrain formation occurs during: 1 point

- (a) Recovery,
- (b) recrystallization,
- (c) Grain growth,
- (d) None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) Recovery,

 3) In strain induced boundary migration: 1 point

- (a) The grain boundary bulging occurs towards the grain with higher strain energy.
- (b) The grain boundary bulging occurs towards the grain with lower strain energy.
- (c) The grain boundary bulging occurs towards the grain with higher dislocation density.
- (d) The grain boundary bulging occurs towards the grain with lower dislocation density.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) The grain boundary bulging occurs towards the grain with higher strain energy.  
(c) The grain boundary bulging occurs towards the grain with higher dislocation density.

 4) During dynamic recovery: 1 point

- (a) Dislocation density increases with strain
- (b) Dislocation density decreases with strain
- (c) Dislocation density remains constant with strain
- (d) Both b and c can occur

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(c) Dislocation density remains constant with strain

 5) Multiple peaks in the flow curve during dynamic recrystallization may occur if: 1 point

- (a) Temperature increases
- (b) critical strain,  $\epsilon_C$  decreases
- (c) Value of Zener–Hollomon parameter decreases
- (d) Peak stress,  $\sigma_{max}$  decreases

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) Temperature increases  
(b) critical strain,  $\epsilon_C$  decreases  
(c) Value of Zener–Hollomon parameter decreases  
(d) Peak stress,  $\sigma_{max}$  decreases

 6) During dynamic recrystallization: 1 point

- (a) New equiaxed grains emerges in high strain regions of the microstructure.
- (b) Necklace structure evolves at the grain boundary area.
- (c) New equiaxed grains emerges in low strain regions of the microstructure.
- (d) Necklace structure does not form.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) New equiaxed grains emerges in high strain regions of the microstructure.  
(b) Necklace structure evolves at the grain boundary area.

 7) In order to reduce the plastic strain energy, the recrystallization texture in FCC material has 30°–40° tilt: 1 point

- (a) ~  $\langle 100 \rangle$  axes
- (b) ~  $\langle 110 \rangle$  axes
- (c) ~  $\langle 111 \rangle$  axes
- (d) None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(c) ~  $\langle 111 \rangle$  axes

 8) The dominant texture component that is/are observed in cold rolled FCC materials after annealing? 1 point

- (a)  $\{001\}\langle 100 \rangle$ ,
- (b)  $\{011\}\langle 100 \rangle$ ,
- (c)  $\{123\}\langle 634 \rangle$ ,
- (d)  $\{011\}\langle 211 \rangle$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a)  $\{001\}\langle 100 \rangle$ ,

 9) The pre-formed nucleus / Subgrain Growth Model will develop multiple grains within an initial single grain if: 1 point

- (a) the orientation difference within the initial grain is quite large.
- (b) the orientation difference within the initial grain is small.
- (c) the initial grain has large lattice curvature.
- (d) the initial grain has small lattice curvature.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) the orientation difference within the initial grain is quite large.  
(c) the initial grain has large lattice curvature.

 10) Dynamic recrystallization (DRX) in Magnesium alloy leads to: 1 point

- (a) 30° rotation of DRX grains from the deformed grains about  $[0001]$ .
- (b) 30° rotation of DRX grains from the deformed grains about  $\langle 11\bar{2}0 \rangle$ .
- (c) No rotation of DRX grains from the deformed grains.
- (d) All the above can occur

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) 30° rotation of DRX grains from the deformed grains about  $[0001]$ .