X

NPTEL

Courses » Heat Treatment and Surface Hardening-I

Announcements   **Course**   Ask a Question   Progress

Unit 2 - Week-1

Course outline

How to access the portal ?

Week-1

○ Introduction to Heat Treatment and Importance of Material Tetrahedron

○ Case studies in reference to Material tetrahedron T/t information and processing

○ Few more case studies in reference to processing with T/t modification

○ Critical Definition and Phase Transformation Thermodynamics and Driving Force

○ Thermodynamics of Phase Transformation Driving force of Phase Transformation

○ Quiz : Assignment-1

○ Week 1 Feedback

○ Assignment-1 solution

Week-2

Week-3

Week-4

Assignment-1

The due date for submitting this assignment has passed. **Due on 2018-02-21, 23:59 IST.**
As per our records you have not submitted this assignment.

1) The inter lamellae distance between ferrite and cementite in the pearlitic colony **1 point** of an annealed low carbon steel specimen is d_1. If the same specimen is air cooled after heating to 1223 K, the new inter lamellae distance (d_2) between ferrite and cementite will be such that

○ $d_1 < d_2$
○ $d_1 > d_2$
○ $d_1 = d_2$
○ can not be decided

No, the answer is incorrect.
Score: 0

Accepted Answers:
$d_1 > d_2$

2) Choose the correct statement related to the heat treatment practices   **1 point**

○ Pearlite is a phase similar to the other phases of steel.
○ Martensite forms due to air cooling of low carbon steel
○ Pearlite becomes finer with increase in cooling rate.
○ The crystal structure of austenite is BCT.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Pearlite becomes finer with increase in cooling rate.

3) Hari quenched an annealed low carbon steel specimen in water after heating to   **1 point** 1200 K. Which of the following observation of Hari is incorrect about the quenched specimen as compared to annealed one

○ Hardness increases
○ Microstructure consists of martensite
○ Tensile strength increases
○ Toughness increases

No, the answer is incorrect.
Score: 0

Accepted Answers:
Toughness increases

4) The lowest amount of carbon can be found in which of the following steel   *1 point*

- ○ 304L stainless steel
- ○ Low carbon steel
- ○ Maraging steel
- ○ IF steel

No, the answer is incorrect.
Score: 0

Accepted Answers:
IF steel

5) The ductility of a martensitic steel can be improved to some extent by which of   *1 point*
the following heat treatment process

- ○ The steel should be annealed then heated to 1200 K and subsequent quenching in water
- ○ The steel should be heated to 1200 K and subsequent quenching in liquid nitrogen
- ○ The steel should be heated to 750 K for 2 hours and the cooled to room temperature
- ○ Ductility can not be improved

No, the answer is incorrect.
Score: 0

Accepted Answers:
The steel should be heated to 750 K for 2 hours and the cooled to room temperature

6) By which of the following way, the problem of sensitization in stainless steel can *1 point*
be reduced

- ○ reducing the carbon content
- ○ adding small amount of niobium
- ○ avoid slow heating/cooling in the range of 400 to 700°C
- ○ above all

No, the answer is incorrect.
Score: 0

Accepted Answers:
above all

7) In which of the following heat treatment practises, sensitization tendency of 18:8 *1 point*
stainless steel is highest

- ○ Heating to 1000°C followed by water quenching
- ○ Heating to 1000°C followed by furnace cooling
- ○ Heating to 1000°C followed by air cooling
- ○ Same in all the above conditions.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Heating to 1000°C followed by furnace cooling

8) Conventionally, the enthalpy of a pure element in its most stable state at 298 K is *1 point*
defined as

- ○ zero
- ○ infinite
- ○ -1
- ○ 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
zero

9) The correct sequence of precipitate formation during precipitation hardening of Al-Cu alloys is **1 point**

- ○ G-P zones à θ'' à θ' à θ
- ○ G-P zones à θ' à θ'' à θ
- ○ G-P zones à θ à θ' à θ''
- ○ G-P zones à θ' à θ à θ'

No, the answer is incorrect.
Score: 0

Accepted Answers:

G-P zones à θ'' à θ' à θ

10) Due to overageing of aluminium alloys, the hardness **1 point**

- ○ Increases
- ○ Decreases
- ○ does not change
- ○ Suddenly increases

No, the answer is incorrect.
Score: 0

Accepted Answers:
Decreases

◁ Previous Page   End ▷