Unit 12 - Week 10

Assignment 10

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-11-25, 23:59 IST.

1) The invariant reaction of two solids transforming to a single solid at constant temperature upon heating is known as a — *1 point*

- eutectic reaction
- eutectoid reaction
- peritectic reaction
- peritectoid reaction

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

2) Monotectic reaction refers to — *1 point*

- a liquid phase transforming to another liquid and solid phase upon cooling
- a liquid phase transforming to another liquid and solid phase upon heating
- a liquid phase and a solid phase transforming into another solid phase upon cooling
- two liquids transforming to another liquid phase and solid phase upon cooling

No, the answer is incorrect.
Score: 0
Accepted Answers:
a liquid phase transforming to another liquid and solid phase upon cooling

3) Identify the CORRECT statement(s) — *1 point*

- Solubility of carbon in plain carbon steel is higher in BCC ferrite since it has more free space compared to FCC austenite.
- Solubility of carbon in plain carbon steel is higher in FCC austenite since it has single largest free volume compared to BCC ferrite.
- The solubility of carbon in steel has nothing to do with its crystal structure.
- δ-iron is magnetic and has BCC crystal structure.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Solubility of carbon in plain carbon steel is higher in FCC austenite since it has single largest free volume compared to BCC ferrite.

Figure 1 shows the phase diagram of Fe-Fe_3 C system. Based on the phase diagram, answer the following questions (Q4 – Q11).

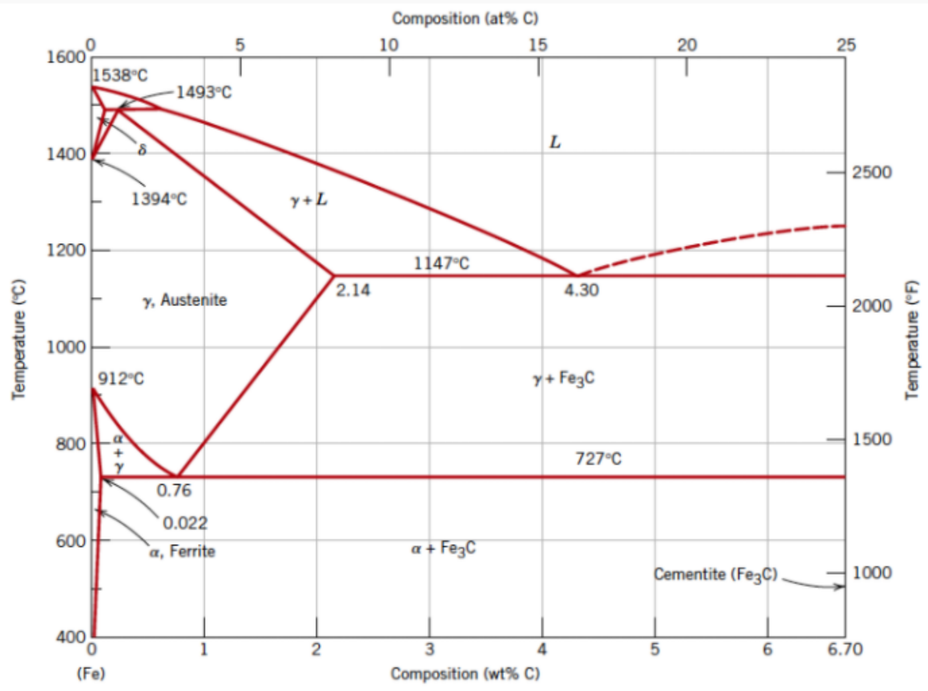

Figure 1: Fe-Fe_3C Phase Diagram.

4) The eutectic mixture of austenite and cementite is called — *1 point*

- martensite
- ledeburite
- bainite
- pearlite

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

5) Cementite is — *1 point*

- a eutectic mixture of iron and carbon
- a eutectoid mixture of iron and carbon
- an intermediate compound of iron and carbon
- eutectoid mixture of austenite and ferrite

No, the answer is incorrect.
Score: 0
Accepted Answers:
an intermediate compound of iron and carbon

6) The maximum solubility of carbon in iron in solid state is — *1 point*

- 4.13%
- 0.78%
- 2.14%
- 0.022%

No, the answer is incorrect.
Score: 0
Accepted Answers:
2.14%

7) The mass fraction of cementite in pearlite at eutectoid composition (rounded to two decimal places) is _____ — *2 points*

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.10,0.12

8) The carbon concentration (rounded off to two decimal places) of an iron-carbon alloy which has the total ferrite fraction as 0.80 is _____ wt% C. — *2 points*

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.34,1.37

9) In a 2.5 kg of austenite containing 0.65 wt% C cooled below 727°C, the mass of pearlite (rounded off to two decimal places) is _____ kg. — *2 points*

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 2.10,2.15

10) The SAE designation of a plain carbon steel given as 1080 can be classified as — *1 point*

- hypereutectoid steel
- hypoeutectoid steel
- hypereutectic steel
- eutectoid steel

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

11) The mass fraction of a eutectoid cementite in an iron-carbon alloy is 0.104. The possible composition(s) of the steel is — *2 points*

- 1.11 wt% C
- 0.72 wt% C
- The data is insufficient to find the composition
- 0.2% C

No, the answer is incorrect.
Score: 0
Accepted Answers:
1.11 wt% C
0.72 wt% C