

Unit 9 - Week 7

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

● Lecture 18: Forms of corrosion: Crevice corrosion (Part-II)

○ Lecture 19: Forms of corrosion: Pitting corrosion (Part-I)

○ Quiz : Assignment 6

○ Assignment-6 Solutions

○ Weekly Feedback

○ Download Videos

Week 8

Week 9

Week 10

Week 11

Week 12

Live Session

Text Transcripts

Assignment 6

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

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

INSTRUCTIONS:

- (A) The marks that each question carries is marked against the question.
(B) There can be more than one correct answers for a question.

1) Which of the following metal/alloys suffer crevice corrosion in sea water? 3 points

- 304 stainless steel
 Aluminum
 Carbon steel
 Brass
 Titanium metal

No, the answer is incorrect.

Score: 0

Accepted Answers:

304 stainless steel

Aluminum

2) Predict the alloy having the highest pitting resistance. 4 points

- 654 SMO (super austenitic stainless steel)
- | C | Mn | Cr | Ni | Mo | N | Cu | Fe |
|-------|------|-----|-----|------|------|------|---------|
| 0.01% | 3.5% | 24% | 22% | 7.3% | 0.5% | 0.5% | balance |
- 2507 (duplex stainless steel)
- | Cr | Ni | Mo | Mn | Si | Cu | N | P | C | S | Fe |
|-----|----|----|------|------|------|-------|--------|-------|-------|---------|
| 26% | 8% | 5% | 1.2% | 0.8% | 0.5% | 0.32% | 0.035% | 0.03% | 0.02% | balance |
- S32707a (duplex stainless steel)
- | C | Si | Mn | P | S | Cr | Ni | Mo | N | Co | Fe |
|-------|------|------|--------|-------|-----|------|------|------|----|---------|
| 0.03% | 0.5% | 1.5% | 0.035% | 0.01% | 27% | 6.5% | 4.8% | 0.4% | 1% | balance |
- S39277 (duplex ss)
- | C | Mn | P | S | Si | Ni | Cr | Mo | N | Cu | W | Fe |
|--------|------|--------|--------|------|----|-----|----|-------|----|------|---------|
| 0.025% | 0.8% | 0.025% | 0.002% | 0.8% | 8% | 26% | 4% | 0.33% | 2% | 1.2% | balance |
- 904L SS
- | Ni | Cr | Mo | Cu | Mn | Si | P | S | Fe |
|-----|-----|----|----|----|----|--------|--------|---------|
| 28% | 23% | 5% | 2% | 2% | 1% | 0.045% | 0.035% | balance |

No, the answer is incorrect.

Score: 0

Accepted Answers:

654 SMO (super austenitic stainless steel)

C	Mn	Cr	Ni	Mo	N	Cu	Fe
0.01%	3.5%	24%	22%	7.3%	0.5%	0.5%	balance

3) The following electrochemical parameters is less important for developing crevice corrosion resistant alloys for a given application 3 points

- Critical current density
 Passivation potential
 Tafel slopes
 Passive current density
 Corrosion current density

No, the answer is incorrect.

Score: 0

Accepted Answers:

Tafel slopes

Corrosion current density

4) Crevice corrosion and pitting corrosion growth of an alloy is mainly due to 4 points

- Chloride levels of the pit and crevice
 High hydroxides within the pit and crevice
 High H^+ ion concentration in the pit/crevice
 Steep potential drop within the pit/crevice
 The exposed corrosive environment does not allow the alloy to passivate at all.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Chloride levels of the pit and crevice

High H^+ ion concentration in the pit/crevice

Steep potential drop within the pit/crevice

5) Which of the following metal/alloys suffer pitting corrosion in seawater? 3 points

- 304 stainless steel
 Aluminum
 Carbon steel
 Brass
 Titanium metal

No, the answer is incorrect.

Score: 0

Accepted Answers:

304 stainless steel

Aluminum

6) The following electrochemical parameters is critical for developing pitting corrosion resistant alloys for a given application 3 points

- Critical current density
 Pitting potential
 Repassivation potential
 Corrosion potential
 Corrosion current density

No, the answer is incorrect.

Score: 0

Accepted Answers:

Pitting potential

Repassivation potential