

Unit 7 - Week 6

Course outline

How does an NPTEL online course work?

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Tribochemistry in wear of cermets

Overview: nanoceramic composites

Wear of YSZ nanoceramics

Wear behavior of nanostructured WC-ZrO₂ nanocomposites

Erosive wear of SiC-WC composites

Quiz : Assignment 6

Solution For Assignment 6

Week 7

Week 8

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WEEKLY FEEDBACK

Assignment 6

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

Due on 2020-03-11, 23:59 IST.

1) Select proper material addition for the possible improvement of hot hardness in TiCN-based cermets

1 point

- MoS₂
- TiC
- TaC
- TiN

No, the answer is incorrect.
Score: 0

Accepted Answers:
TaC

2) For a given SiC-WC composite, maximum erosive wear is expected at

1 point

- 30 degrees impingement angle
- 60 degrees impingement angle
- 90 degrees impingement angle
- 0 degrees impingement angle

No, the answer is incorrect.
Score: 0

Accepted Answers:
90 degrees impingement angle

3) From the study of fretting wear behavior of TiCN-Ni cermets against steel ball in dry ambient conditions at higher load, the most possible observation on wear mechanism is

1 point

- dominantly abrasion
- dominantly tribochemical wear
- erosion and tribochemical wear

No, the answer is incorrect.
Score: 0

Accepted Answers:
dominantly tribochemical wear

4) Choose the WRONG statement from the following:

1 point

- Compared to pressureless sintering, lower temperatures are needed for sintering by spark plasma sintering.
- Compared to pressureless sintering, higher temperatures are needed for sintering by spark plasma sintering.
- Compared to pressureless sintering, grain growth during processing can be effectively restricted in spark plasma sintering.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Compared to pressureless sintering, higher temperatures are needed for sintering by spark plasma sintering.

5) From the following, select proper reinforcement for improvement in toughness in Al₂O₃

1 point

- SiC
- ZrO₂
- WC
- Y₂O₃

No, the answer is incorrect.
Score: 0

Accepted Answers:
ZrO₂

6) Choose the correct statement regarding wear of equally dense nano crystalline Y-TZP ceramics sintered by pressureless sintering, hot pressing and SPS.

1 point

- Pressureless sintered Y-TZP ceramics exhibits less wear
- Hot pressed Y-TZP exhibits less wear
- SPS Y-TZP exhibits less wear

No, the answer is incorrect.
Score: 0

Accepted Answers:
SPS Y-TZP exhibits less wear

7) In dry unlubricated fretting wear conditions, tribomechanical wear is possible in Y-TZP ceramics because of

1 point

- microcracking due to tetragonal to monoclinic transformation of ZrO₂
- microcracking due to monoclinic to tetragonal transformation of ZrO₂
- microcracking due to monoclinic to tetragonal transformation of Y₂O₃
- microcracking due to tetragonal to monoclinic transformation of Y₂O₃

No, the answer is incorrect.
Score: 0

Accepted Answers:
microcracking due to tetragonal to monoclinic transformation of ZrO₂

8) Co in WC-Co cermet tools can be replaced with ZrO₂ because of the possible improvement in

1 point

- resistance to material degradation in high speed machining conditions
- material degradation in high speed machining conditions
- material degradation and chemical instability in machining conditions

No, the answer is incorrect.
Score: 0

Accepted Answers:
resistance to material degradation in high speed machining conditions

9) COF increases with

1 point

- a) work of adhesion
- b) increase in dissipation of frictional energy
- c) increase in sliding speed
- d) a and b
- e) a and c

No, the answer is incorrect.
Score: 0

Accepted Answers:
d) a and b

10) Size of wear debris generally depends on

1 point

- work of adhesion
- load
- tangential force
- speed

No, the answer is incorrect.
Score: 0

Accepted Answers:
work of adhesion