

Unit 8 - HA-based Composites

Course outline

How to access the portal

Week 1 Introduction to Biomaterials and Biocompatibility

Defining tissue engineering scaffolds and implants

Structure and Properties of Proteins and Cells

Stem cells and Cell fate processes

Cell-material Interaction (in vitro and in vivo) and Clinical trials

Manufacturing of Biomaterials (metals, ceramics and polymers)

HA-based Composites

- HA-Ti Toughness, Cell functionality
- HA-CaTiO₃ composite development
- HA-BaTiO₃ Functional properties
- HA-Ag Cell viability Antibacterial properties
- HA-ZnO Cell fate and antimicrobial properties
- Quiz : Week 7 Assignment

Glass ceramics for orthopedic and dental applications, acetabular socket and femoral head, prototype development

Text Transcripts

Week 7 Assignment

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

Due on 2019-09-18, 23:59 IST.

1) Elements generally incorporated in the biomaterial for their antibacterial properties are

1 point

- silver
- calcium
- strontium
- magnesium

No, the answer is incorrect.
Score: 0

Accepted Answers:
silver

2) Doping of Ag in HA-Ag composites can be evaluated qualitatively by

1 point

- Thermo-gravimetric analysis
- Vibrating sample magnetometer
- Infra-Red spectroscopy
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Infra-Red spectroscopy

3) The inhibitory effect of HA-Ag composites on bacteria is due to

1 point

- Ca²⁺ ions
- (PO₄)₃ ions
- Ag⁺ ions
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Ag⁺ ions

4) The advantage of ZnO in HA-ZnO in antimicrobial composites is

1 point

- ZnO is a semiconductor
- ZnO produces H₂O₂ in solution
- increases the strength of the composite
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
ZnO produces H₂O₂ in solution

5) Bactericidal agents are the ones which

1 point

- kill the bacteria
- inhibit the bacterial growth
- mutate the bacteria
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
kill the bacteria

6) Bacterial colony on a biomaterial can potentially be formed from

1 point

- a single bacterium
- 10 bacteria
- 100 bacteria
- 1000 bacteria

No, the answer is incorrect.
Score: 0

Accepted Answers:
a single bacterium

7) Addition of CaTiO₃ to HA enhances the following property(ies)

1 point

- electrical conductivity
- strength and toughness
- dielectric property
- all of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
all of the above

8) Bacteriostatic agents are the ones which

1 point

- kill the bacteria
- inhibit the bacterial growth
- mutate the bacteria
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
inhibit the bacterial growth

9) Following is not related with antibacterial study;

1 point

- minimum inhibitory concentration (MIC)
- zone-inhibition assay (ZIA)
- enzyme-linked immunosorbant assay (ELISA)
- colony forming unit (CFU)

No, the answer is incorrect.
Score: 0

Accepted Answers:
enzyme-linked immunosorbant assay (ELISA)

10) BaTiO₃ is used as an additive to HA for bone replacement applications due to its

1 point

- Piezoelectric property
- strength property
- toughness property
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Piezoelectric property

11) Electrical properties of HA-BaTiO₃ composites depend(s) on

1 point

- BaTiO₃ content
- Sintering technique
- Phase Connectivity
- all of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
all of the above

12) Following factors affect the cell adhesion and growth on substrates

1 point

- Surface charge
- Conductivity
- Elastic stiffness
- all of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
all of the above

13) Fracture toughness of HA can be increased by

1 point

- Metal additives
- Crack bridging
- Polymer additives
- all of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
all of the above

14) The fracture toughness of cancellous bone is _____ cortical bone

1 point

- less than
- more than
- equal to
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
less than

15) For bone mineralization the most suitable Ca and P ratio in HA is

1 point

- 2.56
- 1.67
- 8.67
- 5.00

No, the answer is incorrect.
Score: 0

Accepted Answers:
1.67