Dental Materials II: Mid-Term Exam Version 2.2 February 16, 2009

B

1. Agar (reversible hydrocolloid) has significantly higher physical properties than alginate (irreversible hydrocolloid). True or False?

similar lower

a. True b. False

D

2. In comparing the physical properties of various impression materials; pick the most accurate statement:

a. Polyether impression materials have the greatest flexibility of all elastomers;
b. Addition silicones have low elastic recovery (poor resistance to permanent deformation);
c. Polysulfide impression materials have relatively low (poor) tear strength;
d. Polyethers have low flexibility (high stiffness) compared to other elastomeric impression materials;
e. None of the above

Poly sulfide is most

E

3. Reheating and maintaining a high-gold, copper-containing, dental casting alloy to approximately 400 degrees C. for a period of time results in:

a. solid state diffusion of atoms within the alloy;
b. a random solid solution alloy
c. an ordered solid solution alloy
d. a & b;
e. a & c.

A

4. True or False: The addition of a surfactant to addition silicone impression materials improves their surface wetting or hydrophilic properties.

a. True b. False

A

5. True or false: Incomplete casting of the margins (and rounding of the margins) of a gold alloy restoration can be caused by inadequate heating of the metal, lack of sufficient porosity in the investment, or inadequate casting pressure.

a. True b. False

B

6. The application of a wetting agent does what to the magnitude of the contact angle of a water-based solution (i.e. investment) with the wax surface of a wax pattern?

a. increase b. decrease c. no change d. decrease, then increase e. increase, then decrease

B

7. The current ADA approach to the classification of dental casting alloys involves which criteria?

a. color & composition
b. composition & physical properties
c. cost & color
d. physical properties & color
e. none of the above

B

8. True or False: Conventional high strength stone (die stone) gives equivalent (not greater) compressive strength compared to typical gypsum-based plaster or dental stone materials.

a. True b. False

A

9. Which of the following statements concerning gypsum-bonded investments is true?

a. Should not be used where a constant mold temperature is > 700 °C.
b. Contains silica as a binder.
c. Contains only cristobalite as refractory components.
d. Can be used only for thermal expansion techniques.
e. Is a suitable investment for a high Palladium noble alloy.

C

10. Phosphate-bonded investments have high "green" strength, which means:

a. The investment changes color to a green tint at a critical strength.
b. The investment has a high strength at the precise end of working time.
c. The pre-fired strength of the investment acquired by a chemical reaction at room temperature.
d. The strength of the investment after the wax burn-out process.
e. None of the above.

B

11. Thermal expansion of investment materials, involving the silica polymorph refractory component, is due to the mechanism of:

a) Displacive changes in crystal structure with bond breakage;
b) Displacive changes in the crystal structure without bond breakage;
c) Expansion of the calcium sulfate component;
d) none of the above
e) a & c

D

12. Use of a special liquid consisting of silica sol in water with phosphate-bonded investments provides for:

a. higher setting expansion
b. higher physical strength
c. lower physical strength
d. a and b
e. a and c

B

13. Ethyl silicate-bonded investments may be used for base-metal removable partial denture alloys, as well as casting of nickel-based alloys; whereas phosphate bonded investments can not be used for both indications:True or False?

a. True b. False

14. Which element is added to gold casting alloys specifically as a grain refiner?

Also Iridium

a. Zinc
b. Copper
c. ruthenium
d. Silver
e. Kryptonite

Have High melting point

15. A significant and well-known difficulty with Palladium-Silver alloys is:

a. low elastic modulus
b. high sag tendency
c. "greenish" discoloration of porcelain
d. poor clinical working characteristics
e. poor tarnish and corrosion resistance

16. Which one of the following statements is characteristic of a high strength die stone?

a. The set material contains a high percentage of uncombined water (i.e., ~20%) after setting.
b. Powder particles are irregular, porous, and of low density.
c. The set material has a lower density than plaster.
d. The material has a higher water/powder ratio than regular stone.
e. None of the above.

17. When your regular impression material is not available, your dental assistant purchases a private label impression material. You take an excellent impression, which your assistant pours up immediately in die stone. When the model is separated from the impression, the surface of the model is covered with numerous small bubbles. The type/chemistry of this private-label impression material is:

a. polyether b. agar c. condensation silicone d. addition silicone e. none of the above

Free Radical poly w/ Plat catalyst
Have H_2 as by product. H_2 Absorbed by Palladium

18. Which element is added to a flux when used with chromium-containing alloys to dissolve chromium oxides?

a. potassium fluoride b. chlorine c. potassium borate d. sodium chloride e.calcium tetraborate

19. True or false: Incomplete burnout of wax can produce a black coating on the casting.

a. True b. False

20. Based on its melting temperature, a 75% gold, Type III gold alloy can be melted adequately with a:

a. air-acetylene torch b. air-gas torch c. oxygen-acetylene torch
d. oxygen-gas torch e. none of these answers

21. Which of the following impression materials has the best resistance to permanent deformation?

a. polyether b. polysulfide c. condensation silicone d. addition silicone e. agar

Worst

E

22. The fusion temperature of the solder should be at least _____ °C. below that of the parts being joined.

a. 16 b. 26 c. 36 d. 46 e. 56

D

23. Which quality refers to the property of a solder to spread and flow well over the surfaces of the parts being joined?

a. easy flowing b. broadly flowing c. rapid flowing d. free flowing e. easy spreading

B

24. The _____ temperature of an alloy determines the burnout temperature, type of investment, and type of heat source to be used during the casting process.

a. solidus b. liquidus c. 40% of liquidus d. 80 % of solidus e. none of the above

C

25. Sulfur and sulfur-containing compounds inhibit the polymerization of which impression material?

a. polysulfide b. condensation silicone c. addition silicone d. polyether

B

26. Rapid removal of an elastomeric impression results in larger distortion of the impression on removal.

smaller

a. True b. False

E

27. If a practitioner desires a material with optimal hydrophilic (water-loving or water tolerating) qualities, but does not desire a significant expenditure in upfront equipment costs and/or considerable staff procedural training; what would be the best choice?

a. agar b.polysulfide c. condensation silicone d. addition silicone e. polyether

B

28. True or false: Mixing a phosphate bonded investment (PBI) with excess water results in a substantial amount of hygroscopic expansion.

a. True b. False

D

29. The chemical reaction of a phosphate bonded investment at room temperature results in a lowering of the mixed viscosity due to the production of excess

a. monoammonium phosphate b. alcohol c. magnesia
d. water e. ammonium magnesium phosphate

A

30. The approximate displacive transition temperature (temperature at which change in this crystalline form of silica causes a significant increase in expansion) for cristobalite is:

a. approximately 200 – 220 °C. b. approximately 100 – 150 °C. c. approximately 50 – 100 °C.
d. approximately 400 – 450 °C. e. approximately 500 – 600 °C.

set 45 - 60 min

in over 20 - 30 min

PBI is high Temp

31. In comparison to a gold-based alloy, palladium-based alloys:

a. have an increased tendency to tarnish
b. have increased solidus and liquidus temperature
c. can be used easily with gypsum-based investments
d. have reduced hardness
e. none of the above

B

32. According to hardness, the Type IV gold dental alloys can be described as:

a. soft
b. medium
c. medium-hard
d. extra-hard
e. none of the above

D

I soft
II medium
III hard
IV extra hard

33. By definition, high-noble alloys:

a. contain a minimum of 50 wt% tin
b. must have a noble metal content of at least 60 wt%, of which at least 40 wt% is gold
c. must have a noble metal content of at least 60 wt%, of which at least 35 wt% is platinum
d. consist of 10 wt% gold, 10 wt% silver, and 80 wt% copper
e. none of the above

B

High Noble

34. Noble alloys:

a. have to contain (by definition) at least 15 wt% noble metal
b. are not suitable for porcelain-fused-to-metal (PFM) indications
c. are brittle and can fracture readily
d. do not contain palladium
e. none of the above

E

No defined melting point

35. By definition, base-metal alloys contain less than ____ wt% noble metals.

a. 10
b. 15
c. 25
d. 30
e. none of the above

C

High Noble >60% noble >40% is gold
Noble >25% noble
1° Base <25% noble

36. Which of the following element(s) is/are classified as noble?

a. Gold, palladium, and platinum
b. Silver
c. Indium
d. All of the above
e. (a) and (c)

A

Does not form oxide

Zinc scavenges to prevent oxidation

37. Which element(s) generally serves/serve as hardening element(s) in alloys with high gold content?

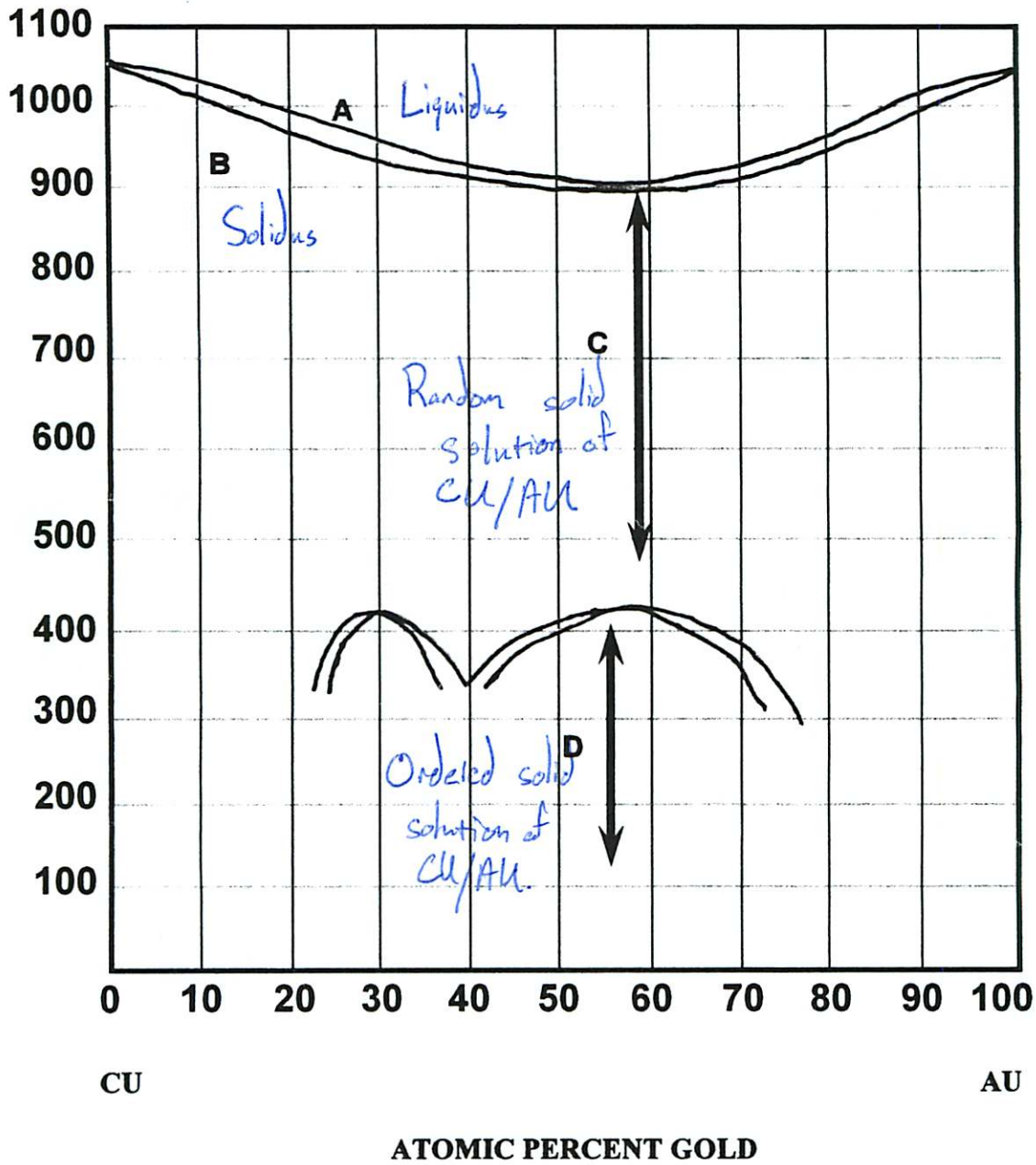
a. Copper
b. Silver
c. Palladium
d. Platinum
e. All of the above

E

Also
Counters Orange appearance
Face Centered Cubic structure
↑ MP

9-16% allergic to nickel.

Questions 38 through 41 refer to the gold-copper phase diagram below:



38- The upper line **A** in the above binary phase diagram represents

A

a. the liquidus line
b. the solidus line
c. the intermetallic phase line
d. the micrograin alloy line
e. none of the above

39- The lower line **B** in the above binary phase diagram represents

B

a. the liquidus line
b. the solidus line
c. the intermetallic phase line
d. the micrograin alloy line
e. none of the above

40- The domain or area designated **C** represents

B

a. an ordered solid solution of gold and copper
b. a random solid solution of gold and copper
c. an oriented solution of gold and copper
d. a tertiary phase distribution domain
e. an amorphous glassy phase

41- The domain or area designated **D** represents

A

a. an ordered solid solution of gold and copper
b. a random solid solution of gold and copper
c. an oriented solution of gold and copper
d. a tertiary phase distribution domain
e. an amorphous glassy phase

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