

**\*\*\* EXAMINATION \*\*\***

**PARTICLE FORMATION IN LAMINAR FLAMES INHIBITED BY METALS**

1. **Organometallic compounds are also known as**
  - a) organo-inorganics
  - b) metallo-organics
  - c) metalorganics
  - d) All of the above
  
2. **A free-flowing, straw-colored liquid with a pungent odor is**
  - a) iron nitrate
  - b) iron pentacarbonyl
  - c) iron sulphide
  - d) iron oxide
  
3. **The strong inhibition for iron occurs from a catalytic radical**
  - a) recombination cycle involving iron carbonyl and tin
  - b) recombination cycle involving iron oxides and hydroxides
  - c) recombination cycle involving iron nitrate and lead
  - d) recombination cycle involving cuprum and aurum
  
4. **Transit times and the dwell time in a flame are measured**
  - a) using a laser
  - b) using a oscilloscope
  - c) using a photodiode
  - d) All of the above
  
5. **For low strain rate flames, the particle has a diameter**
  - a) between 1 nm and 3 nm
  - b) between 5 nm and 8 nm
  - c) between 10 nm and 30 nm
  - d) between 50 nm and 80 nm
  
6. **An effective gaseous fire suppression agent in the 1960s**
  - a) was bromotrifluoromethane
  - b) was dibromodifluoromethane
  - c) was tribromofluoromethane
  - d) was pentafluoroethane

7. **Brominated fire suppressants and similar compounds**
- a) have deleterious effects on tropospheric ozone
  - b) have deleterious effects on stratospheric ozone
  - c) have deleterious effects on mesospheric ozone
  - d) have deleterious effects on hydrospheric ozone
8. **The chemical compound composed of two oxygen atoms covalently**
- a) bonded to a single carbon atom is carbon nitrate
  - b) bonded to a single carbon atom is carbon monoxide
  - c) bonded to a single carbon atom is carbon dioxide
  - d) bonded to a single carbon atom is carbon hydroxide
9. **Bromotrifluoromethane is seven times more effective than**
- a) carbon dioxide at inducing the flame speed
  - b) carbon dioxide at reducing the flame speed
  - c) carbon dioxide at inducing the flame volume
  - d) carbon dioxide at reducing the flame volume
10. **The simplest organotin compound is**
- a) the tetramethyltin
  - b) the methylcyclopentadienylmanganese tricarbonyl
  - c) the ferrocene
  - d) the iron pentacarbonyl
11. **A supplement to gasoline to increase the fuel octane**
- a) rating is tetramethyltin
  - b) rating is methylcyclopentadienylmanganese tricarbonyl
  - c) rating is ferrocene
  - d) rating is iron pentacarbonyl
12. **A organometallic compound also known as sandwich compound**
- a) is tetramethyltin (TMT)
  - b) is methylcyclopentadienylmanganese tricarbonyl (MMT)
  - c) is ferrocene
  - d) is iron pentacarbonyl
13. **Inorganic compounds that contain the hydroxyl group are**
- a) referred to as hydroxides
  - b) referred to as hydrochlorides
  - c) referred to as hydrolytes
  - d) referred to as hydroxilites
14. **Iron pentacarbonyl is eighty times more effective than**
- a) CF<sub>3</sub>Br at reducing the burning velocity of premixed flames
  - b) MMT at reducing the burning velocity of premixed flames
  - c) TMT at reducing the burning velocity of premixed flames
  - d) SnO at reducing the burning velocity of premixed flames

15. **Iron pentacarbonyl is forty times more effective than**
- a) CF<sub>3</sub>Br at reducing the burning velocity of premixed flames
  - b) MMT at reducing the burning velocity of premixed flames
  - c) TMT at reducing the burning velocity of premixed flames
  - d) SnO at reducing the burning velocity of premixed flames
16. **Iron pentacarbonyl is three times more effective than**
- a) CF<sub>3</sub>Br at reducing the burning velocity of premixed flames
  - b) MMT at reducing the burning velocity of premixed flames
  - c) TMT at reducing the burning velocity of premixed flames
  - d) SnO at reducing the burning velocity of premixed flames
17. **Flame types tested with the organometallic inhibitors**
- a) include a premixed flame
  - b) include a counterflow diffusion flame
  - c) include a o-flow diffusion flame
  - d) All of the above
18. **The organometallic inhibitors are added to the flames using**
- a) single-stage saturators in controlled temperature baths
  - b) single-stage saturators in uncontrolled temperature baths
  - c) multi-stage saturators in controlled temperature baths
  - d) multi-stage saturators in uncontrolled temperature baths
19. **Light-scattering techniques with phase-sensitive detection**
- a) are used to determine particle position and loads
  - b) are used to determine particle location and properties
  - c) are used to determine particle capacities and densities
  - d) are used to determine particle volume and signal
20. **The steep temperature gradients in the present flames cause**
- a) significant beam movement and relocation
  - b) significant beam absorption and rejection
  - c) significant beam expansion and distortion
  - d) significant beam steering and distortion

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