



## CHEMISTRY

### BOOKS - S CHAND IIT JEE FOUNDATION

### COMBUSTION AND FLAME

#### Question Bank 17 Fill In The Blanks

1. \_\_\_\_\_ is a chemical process in which a substance reacts with oxygen to give off heat.



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2. A \_\_\_\_\_ is a substance which undergoes combustion to produce heat.



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3. Substances which burn easily are called \_\_\_\_\_.



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4. Substances which do not burn easily are called \_\_\_\_\_.



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5. The lowest temperature at which a substance catches fire and starts burning is called \_\_\_\_\_ temperature.



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6. Three essential requirements for producing fire are fuel, heat and \_\_\_\_\_



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7. The substances which have very low ignition temperature and can easily catch fire with a flame are called \_\_\_\_\_ substances.



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8. The type of combustion in which the substance burns rapidly and produces heat and light is called \_\_\_\_\_ combustion.



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9. The type of combustion in which a material bursts suddenly into flame only on without application of any apparent cause, is called \_\_\_\_\_ combustion.



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10. A sudden very fast reactions that takes place with the evolution of heat, light and large amount of gas is called an \_\_\_\_\_.



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11. The amount of heat evolved when 1 kg of a fuel is burnt completely is called its \_\_\_\_\_.



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12. Fire produced by oil cannot be controlled by \_\_\_\_\_.



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13. Increased concentration of carbon dioxide in the air is supposed to be the cause of \_\_\_\_\_.



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14. The unit of calorific value of a fuel is \_\_\_\_\_

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15. Burning of coal and diesel releases \_\_\_\_\_ gas which is extremely suffocating and corrosive.

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16. Petrol engines give off gaseous oxides of \_\_\_\_\_.





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17. Oxides of sulphur and nitrogen produced as a result of burning of coal, diesel and petrol dissolve in rain water to form \_\_\_\_\_ which is known as \_\_\_\_\_.



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18. The region where combustion of gases takes place is called \_\_\_\_\_.



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19. Fuels that have been formed from dead remains of plants and animals are called \_\_\_\_\_.



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20. A yellow flame on a burner shows \_\_\_\_\_ combustion.



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1. Arrange the following fuels in the increasing order of their calorific values.

Hydrogen gas, wood, LPG, coal, kerosene

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2. In an experiment 4.5 kg of a fuel was completely burnt. The heat produced was measured to be 180,000 kJ. Calculate the calorific value of the fuel.

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3. Which of the following is not used as fuel?

A. LPG

B. CNG

C. hydrogen

D. oxygen

**Answer: D**



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4. Which among the following is not a fuel?

A. cow dung

B. natural gas

C. coal

D. sodium

**Answer: D**



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5. In which zone of a flame fuel remains in vapour form?

A. blue

B. dark zone

C. luminous zone

D. non-luminous zone

**Answer: B**



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6. When the clothes of a person catch fire, you should cover the person with

A. polythene

B. paper

C. blanket

D. nylon fibre

**Answer: C**



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7. What are the three essential requirements to produce fire? How fire extinguisher is useful for controlling the fire.

A. water, light and air

B. fuel, air and heat (ignition temperature)

C. carbon dioxide, water and light

D. carbon monoxide, nitrogen and heat

**Answer: B**



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8. Inflammable substances have an ignition temperature:

A. less than  $100^{\circ}C$

B. more than  $100^{\circ}C$

C. more than  $200^{\circ}C$

D. between  $200^{\circ}C$  to  $350^{\circ}C$

**Answer: A**



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**9.** The colour of the flame with the highest amount of heat is

A. white

B. yellow

C. red

D. blue



**Answer: D**



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**10.** Type of flame produced by a fuel depends upon

- A. calorific value
- B. amount of oxygen
- C. type of fuel and its chemical composition
- D. all of the above

**Answer: B**



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11. In which type of combustion the fuel catches fire immediately.

A. slow combustion

B. rapid combustion

C. explosion

D. mild reaction

**Answer: B**



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12. Which of these is a non-combustible substance?

A. camphor

B. candle

C. charcoal

D. coal

**Answer: C**



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13. Which of the following is mixed with a volatile liquid (ethyl mercaptan) to make it smell strongly?

A. Coal gas

B. CNG

C. LPG

D. Hydrogen

**Answer: C**



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**14.** Total amount of heat produced by a fuel having calorific value of 30 kJ/kg. was found to be 60,000 joules. How much fuel was burnt?

A. 2000 kg

B. 200 kg

C. 20 kg

D. 2 kg

**Answer: D**



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15. Which one of the following is not a fossil fuel?

A. petrol

B. charcoal

C. kerosene

D. diesel

**Answer: B**



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16. Yellow colour of the flame indicates

- A. partial combustion
- B. complete combustion
- C. unburnt wax vapour
- D. non-luminous zone

**Answer: A**



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**17. Substance having low ignition temperature is**

- A. combustible
- B. inflammable

C. non-combustible

D. none of these

**Answer: B**



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**18.** When wood is used as fuel in chullahs, gaps are left in between the logs of wood. This is done to

A. ensure less consumption of food

B. control temperature

C. ensure movement of air



D. none of the above

**Answer: C**



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**19.** When water is poured over burning wood, the fire goes off. This is because

A. temperature of wood decreases

B. temperature of water goes up

C. molecules of water react with oxygen present in the flame

D. the flame vapourises

**Answer: A**



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**20.** Which of the following statements is not true?

A. Flame can be seen over burning solids and liquids.

B. Type of flame depends upon the amount of oxygen available.

C. Invisible zone of a flame is the least hot zone

D. Blue zone indicates complete combustion of fuel.

**Answer: C**

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**21.** Match the points mentioned in column 'A' to the points mentioned in column B with regard to the zones of a flame and its characteristics.

**A**

1. Dark inner zone
2. Blue zone
3. Luminous zone
4. Non-luminous zone

**B**

- a. Hottest part (no Carbon)
- b. Partial decomposition
- c. Unburnt vapours of wax
- d. Complete combustion

A. 1-a, 2-b, 3-c, 4-d

B. 2-a, 3-b, 4-d, 1-c

C. 3-a, 4-b, 2-c, 1-d

D. 4-a, 1-b, 2-c, 3-d

**Answer: B**



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**22.** Glass, metals, ceramics are the example of

A. non-combustible materials

B. combustible materials

C. transparent

D. none of the above

**Answer: A**



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**23.** Oxides of nitrogen and sulphur dissolve in rain water to produce

A. acid rain

B. alkalies

C. neutral solutions

D. salt solutions

**Answer: A**



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**24.** Explain why , we are advised not to sleep in a room having closed door and windows, with a coal fire burning inside.

A. the room becomes two hot

B. the carbon monoxide gas evolved can kill the persons in the room

C. the things present in the room can catch fire

D. the ash formed during the combustion may

spread over the room

**Answer: B**



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**25.** Fire is extinguished by

A. removing all combustible substances

B. cutting off supply of air

C. cooling the burning substances

D. all of these

**Answer: D**



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**26.** Hydrogen gas has the highest calorific value, i.e., 150 kJ/kg, yet it is not used as a fuel, because

- A. it is explosive in nature
- B. it causes storage problem
- C. it causes transportation problem
- D. all of the above



**Answer: D**



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**27. Which of the following statements is not true?**

A.  $CO_2$  is the best fire extinguisher

B. Global warming can cause acid rain

C. Burning of coal and diesel releases sulphur dioxide ( $SO_2$ ) gas

D. LPG has higher calorific value than biogas

**Answer: B**



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**28.** Charcoal does not produce a flame because

- A. it is a solid fuel
- B. it has very high calorific value
- C. it does not vapourise
- D. it is black in colour

**Answer: C**



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29. An electric spark is struck between two electrodes placed near each other in a closed tank full of petrol. Will the petrol catch fire ? Explain your answer.

A. spontaneous combustion of petrol

B. explosion

C. slow combustion of petrol

D. nothing will happen

**Answer: D**



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30. Identify the incorrect statement among the following:

A. water cools the combustible material

B. water vapours surround the combustible material

C. water lowers the temperature of the combustible material

D. water acts as an electrolyte

**Answer: D**



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**31.** Arrange the following fuels in increasing order of their calorific value

1. Petrol

2. Diesel

3. Kerosene

4. Natural gas

A. 1, 2, 3, 4

B. 2, 3, 4, 1

C. 2, 1, 3, 4

D. 3, 2, 1, 4

**Answer: B**



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**32.** In foam type fire-extinguisher what is responsible to put off fire?

A.  $H_2O$

B.  $CO_2 + H_2O$

C.  $CO_2$

D. CO

**Answer: C**



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**33.** The ignition temperature of white phosphorus is nearly equivalent to

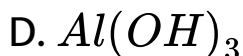
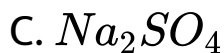
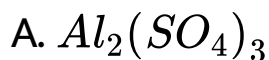
- A. room temperature
- B. body temperature
- C. temperature of the sun
- D. temperature of the earth

**Answer: B**



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34. In foam type fire-extinguisher which one of the following is present in the cylinder?



**Answer: B**



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**35.** Forest fire is an example of

- A. slow combustion
- B. rapid combustion
- C. spontaneous combustion
- D. explosion

**Answer: C**



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**36.** The head of a safety matchstick contains

A. Antimony trisulphide

B. Potassium chlorate

C. Both (a) and (b)

D. Sulphur

**Answer: C**



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**37.** Which of the following does not form a flame?

A. bunsen burner

B. candle

C. charcoal

D. kerosene lamp

**Answer: C**



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**38.** The luminous zone of a flame:

A. consists of unburnt carbon particles

B. possess maximum temperature

C. is yellow in colour

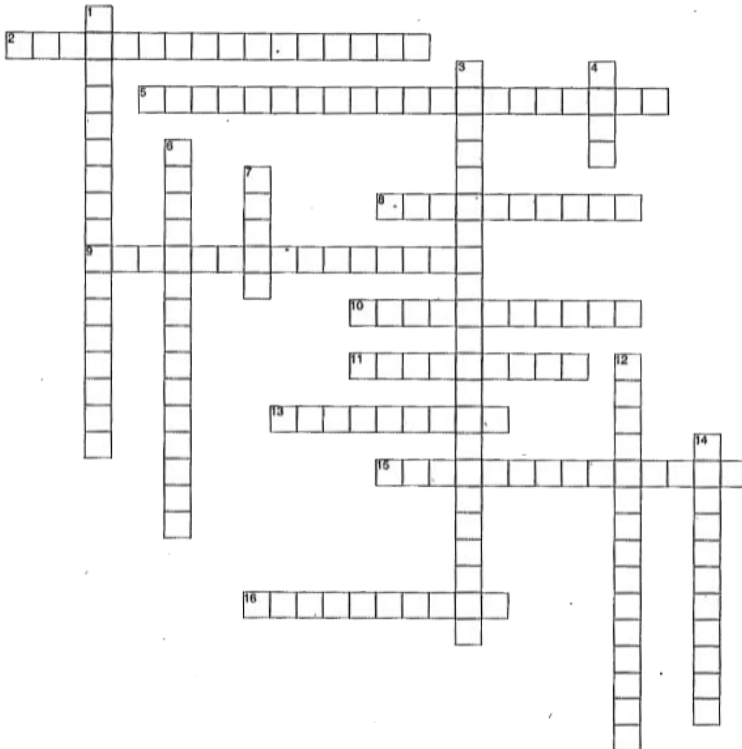
D. is the zone of complete combustion

Answer: A



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39. Solve the following crossword with the help of the given clues:



Clues:

## ACROSS

2. The process in which the substance burns rapidly producing heat and light.

5. The minimum temperature to which a substance needs to be heated before it starts burning.

8. A fuel which fulfils all the characteristics of a good fuel

9. The substances which do not catch fire like stone, iron, sand, etc.

10. A substance which burns easily, in the presence of air, like paper, petrol, kerosene, etc.

11. formed by dissolution of oxides of sulphur and nitrogen in rain water.

13. A combustion, in which sudden reaction (burning, takes place with the evolution of heat, light and a large amount of gas.

15. Rise in temperature of the environment of the earth due to increased concentrations of carbon dioxide in the air.

16. The process of burning in the presence of air when the substance reacts with oxygen to produce heat.

DOWN

1. Device used to extinguish fire.

3. The type of combustion in which a substance suddenly bursts into flame without application of any apparent cause.

4. A material used to make fire. On burning, it produces heat and light.

6. The efficiency with which a good fuel having characteristics of an ideal fuel burns.

7. The hot, glowing of burning region of gases and tiny particles that arises from combustion.

12. The amount of heat energy given out on burning 1 kg of a fuel.

14. Substances like petrol, alcohol, etc. having very low ignition temperature that catch fire easily.



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1. Carbon dioxide is the best fire extinguisher for fires involving electrical equipment and inflammable materials like petrol?



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2. Fire produced by burning oil can be controlled by water.



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3. The substances like coal, have low ignition temperature and so need strong heating to catch fire.

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4. Fossil fuels are an inexhaustible natural resource of fuel.

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5. It is the vapour form of fuel that catches flame.

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6. A combustible substance can catch fire on its own.

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## Question Bank 17 Answer The Questions

1. How has the use of CNG in automobiles reduced pollution in our cities?

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2. Why is water not used to control fires involving electrical equipment?



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3. Give reasons.

LPG is a better domestic fuel than wood



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4. Give reasons.

Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.



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5. Explain how is  $CO_2$  able to control fire?



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6. It is difficult to burn a heap of green leaves but dry leaves catch fire easily. Explain.

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7. Which zone of a flame does a goldsmith use for melting gold and silver and why?

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8. Can the process of rusting be called combustion? Discuss.

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9. Jyoti and Sanjay were doing an experiment in which water was to be heated in a beaker. Jyoti kept the beaker near the wick in the yellow part of the candle flame. Sanjay kept the beaker in the outermost part of the flame. Which water will get heated in a shorter time?

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10. Can you burn a piece of wood by bringing a lighted matchstick near it ? Explain.



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## Self Assessment Sheet 17 Fill In The Blanks

1. A fuel must be heated to its \_\_\_\_\_ before it starts burning.



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2. The most common supporter of combustion around us is \_\_\_\_\_.



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3. Burning of wood and coal causes \_\_\_\_\_ of air.



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4. An important liquid fuel, used in homes is \_\_\_\_\_.



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5. The rise in temperature of the environment of the earth is called \_\_\_\_\_.



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6. What type of combustion is represented by:  
burning of white phosphorus in air at room  
temperature?



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7. What type of combustion is represented by :  
burning of LPG in a gas stove ?

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8. What type of combustion is represented by :  
ignition of a cracker ?

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9. Make a labelled diagram of a candle flame.

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**10.** List conditions under which combustion can take place.



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**11.** Define ignition temperature.



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**12.** What are the main constituents of biogas and kitchen gas (LPG)?



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**13.** What is LPG? Mention its main component.

Why is a smelling agent added to it?



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**14.** "The calorific value of LPG is 55000 kJ/kg". What

does it mean ?



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**15.** Which of the following fuels has the lowest calorific value ?

Diesel, Methane, CNG, Coal, Petrol



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**16.** Which of the following fuels has the highest calorific value?

Wood, Cow-dung cakes, Petrol, Hydrogen gas.



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**17.** Explain why, fire caused by electricity should not be extinguished by pouring water?



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**18.** How is the fire produced by burning oil (or petrol) extinguished?



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**19.** A durm full of kerosene catches fire. What is the simplest way to put off this fire ?

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20. Why is kerosene used in stoves and not petrol?

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21. Describe how a matchstick is lighted.

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22. Combustion is the process of

- A. Production of explosive sound
- B. Oxidation of fuel
- C. Vaporization of fuel
- D. Burning of fuel generating heat

**Answer: D**



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