HỌC TỪ VỰNG

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PASSAGE 4

Questions 31-40

15 minutes

GHI CHÚ

Các câu hỏi dễ hơn cần ưu tiên trả lời đúng

★ Câu hỏi thông tin chi tiết: **34, 35, 37**

★ Câu hỏi tham chiếu: **36**

★ Câu hỏi từ vựng: **33**

★ Câu hỏi ý chính: **31**

Nickel (Ni), a precious metal with unique resistance to high temperatures, corrosion, and other extreme conditions, is occasionally used alone but is more often combined with another metal or metals to form an alloy used for different industrial applications. Different combinations of nickel and other metals can be combined to form alloys with specific characteristics.

One common nickel-based alloy is stainless steel, which generally contains 10 percent nickel and 90 percent iron. Alloys containing lower percentages of nickel resist stress and extreme temperatures more poorly compared to alloys with higher percentages of nickel. Alloys with higher percentages of nickel are called super-alloys, and may have nickel percentages as high as 70 percent, along with other substances that give them very specific performance features. Substances commonly combined with nickel to make super-alloys are chromium, iron, and cobalt. Super-alloys are used for chemical processing, the aerospace industry, various medical applications, and power plants.

It is vital that nickel mined for use in super-alloys is as pure as possible, because the parts manufactured from super-alloys are generally responsible for the proper functioning of the larger unit, or "safety-critical." For this reason, mined nickel is **refined** specifically

until it reaches the proper level of purity to be combined in a super-alloy for safety-critical parts. This extremely pure nickel is called high-purity nickel, and is extremely valuable because only a small portion of the nickel mined worldwide is ever refined to the required state of purity to be labeled high-purity nickel.

Nickel is extracted from ore by roasting at high temperatures. [A] This achieves up to a 75 percent purity level, which is enough for the many alloys creating stainless steel. [B] For more resistant alloys, however, the nickel must be refined further. [C] The most common nickel-refining process is a three-step procedure of flotation, smelting, and something called the Sherritt-Gordon process, in which the nickel is treated with hydrogen sulfide (which removes any copper) and then a solvent that separates the nickel from any cobalt. [D] **This procedure** can achieve 99 percent purity, which is enough for most industrial applications, but is still not high-purity nickel.

High-purity nickel is further refined using the Mond process achieving 99.99 percent purity to create high-purity nickel. Named after its creator, the Mond process has been in use for over a century and involves several steps of refining. The first involves changing the nickel to nickel carbonyl by combining the nickel with carbon monoxide at a very specific temperature. Then the nickel carbonyl is put through a chamber filled with nickel pellets and stirred until it decomposes and sticks to the pellets, or heated to a temperature of 230 degrees Celsius at which it turns into a fine, pure powder called carbonyl nickel, or high-purity nickel.

Because the refining process to create high-purity nickel requires so many steps and such specific conditions, it is not performed in many locations. This means that high-purity nickel is quite expensive, and the producers of high-purity nickel have significant control over the market price. This creates a unique industry situation, and the two main producers of high-purity nickel have been investigated by authorities in several countries to determine if they have been colluding on price or exercising undue control over prices through the duopoly in the industry.

31 What is the passage mainly about?

A. Nickel-based common alloys

B. Nickel-based super alloys

C. Nickel extraction

D. Nickel mining

32 What can be inferred from paragraph 2?

A. super-alloys resist stress and extreme temperatures better than regular alloys do

B. super-alloys contain iron just as stainless steel does

C. super-alloys contain cobalt instead of iron

D. stainless steel is a super-alloy with stress-resistant characteristics

33 The word '**refined**' in paragraph 3 is closest in meaning to

A. paid

B. mined

C. combined

D. purified

34 How are super-alloys different from alloys?

A. they contain higher percentages of nickel

B. they contain higher percentages of stainless steel

C. they require longer mining times

D. they do not contain nickel

35 Part of the Sherritt-Gordon process involves

A. mining the nickel

B. removing copper from the nickel

C. creating a super-alloy

D. achieving 99.9 percent purity

36 The phrase '**This procedure**' in paragraph 4 refers to

A. the alloy process

B. the Sherritt-Gordon process

C. the Mond process

D. the carbonyl nickel process

37 What is true about the Mond process?

A. The Mond process and Sherritt-Gordon process are interchangeable.

B. The Mond process achieves lower purity than the Sherritt-Gordon process does.

C. The Mond process must be started immediately after mining the nickel to be effective.

D. The Mond process achieves higher purity than the Sherritt-Gordon process does.

38 In which space (marked A, B, C and D in the passage) will the following sentence fit?

There are two processes used to refine nickel to a high-enough level of purity to be used in more resistant alloys.

A. [A] **B.** [B]

C. [C] **D.** [D]

39 Which is NOT implied in the passage?

A. Nickel not refined and made into super-alloys is made into stainless steel.

B. Nickel must be refined before it can be combined into a super-alloy.

C. The Mond process produces high-purity nickel.

D. The Sherritt-Gordon process is not sufficient to refine nickel enough to make safety-critical parts.

40 Why does the author mention the cost of refining high-purity nickel in paragraph 6?

A. to explain why safety-critical parts are so expensive to manufacture

B. to propose a solution to the revenue problems the producers of high-purity nickel face

C. to question why producers can't lower prices to the market

D. to explain why the two producers of high-purity nickel have such influence over the price of high-purity nickel

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