

一、专业术语翻译（每题 1 分，共 20 分）

1. the Bronze Age 青铜时代 2. yield strength 屈服强度
3. biomaterial 生物材料 4. precipitation hardening 沉淀硬化
5. forging 锻造 6. austenitic stainless steel 奥氏体不锈钢
7. semiconductor 半导体 8. solid solution 固溶
9. toughness 韧性 10. strength-to-weight ratio 的强度 - 重量比
11. 化学键 Bond 12. 晶体 Crystals
13. 超塑性 Superplasticity 14. 合金钢 Alloy steel
15. 面心立方 Fcc 16. 铸铁 Cast iron
17. 耐腐蚀性 Corrosion 18. 有色金属 Non-ferrous metals
19. 切削性能 Cutting 20. 复合材料 Composites

二、英汉互译（每题 6 分，共 36 分）

1. Any important technological progress is often linked to the development of materials endowed with improved or new properties. It is possible to increase in a substantial way the efficiency of gas turbines (aircraft jet engines) by working at a higher temperature. The development of more successful engines is thus linked with ending metal alloys more resistant to creep or ceramics having better resistance to thermal shock.

1.所有重要的技术进步往往与对赋予了改进或新特性的材料的开发。这是可能的燃气轮机（飞机喷气发动机）的效率通过在更高温度下工作的实质的方式来增加。更成功的发动机的开发因此结尾具有抗热冲击性能较好的金属合金更耐蠕变或陶瓷连结。

2. Aluminum oxide is typical of the traditional ceramics, with magnesium oxide and silica being other good examples. In addition, SiO₂ is the basis of a large and complex family of silicates, which includes clays and

claylike minerals. Silicon nitride has already been described as an important non-oxide ceramic. The vast majority of commercially important ceramics are chemical compounds between at least one metallic element and one of five nonmetallic elements(C, N, O, P, or S).

2.氧化铝是典型的传统陶瓷，氧化镁和二氧化硅等被很好的例子。此外，二氧化硅是一个庞大而复杂的家庭硅酸盐，包括粘土和粘土状矿物的基础。氮化硅已经被描述为一个重要的非氧化物陶瓷。商业上重要的陶瓷绝大多数是至少一种金属元素和五个非金属元素（C, N, O, P 或 S）1 之间的化学化合物。

3. Tool steels have unique properties such as high temperature stability, wear resistance, machinability, and toughness. Most tool steels are brittle, unless specially treated to increase their toughness. Such properties of tool steels permit their use as tools for cutting and shaping metals and other materials both hot and cold. Applications focus on four basic categories: shock-resistant, hot-working, cold-working, and high-speed.

3.工具钢具有独特的性能，如高温稳定性，耐磨耗性，机械加工性，和韧性。大多数工具钢是易碎的，除非经过特殊处理，以增加其韧性。工具钢这样的性质允许它们作为用于切分和成型的金属和其他材料的热和冷的工具的使用。应用集中于四个基本类别：耐冲击，热加工，冷加工，和高速。

4. 通常，我们将材料分为三大类，金属及其合金、高分子材料与陶瓷。这种分类方法的依据是材料的原子结构及其化学键类型。其中，金属及其合金通常是良好的导电、导热材料，且多数金属及其合金坚硬、熔点高并能承受一定的塑性变形。

4. Typically, we will be divided into three categories materials, metals and alloys, polymers and ceramics. This classification is based on the atomic structure and chemical bonding types of materials. Among them, the metal and its alloys are usually good electrical conductivity, thermal conductivity material, and most of the metal and its alloys hard, high melting point and can withstand a certain degree of plastic deformation.

5. 自然界中的固态材料可分为晶态 (crystalline) 材料与非晶态材料 (amorphous), 二者性能不同。晶态材料加热时保持固态直至某一温度熔化变为液态; 非晶态材料加热时在一个较宽的温度范围内逐渐软化, 最终变为液态。

5. The nature of the solid materials can be divided into crystalline (crystalline) material with amorphous material (amorphous), the performance difference between the two. Crystalline material remains heated until a temperature of melting the solid state to a liquid state; softens gradually over a wide temperature range when the amorphous material is heated, and ultimately into a liquid.

6. 铸铁本质上是铁、碳和硅 (silicon) 的合金, 其成分是铁、2%-6.67% 的碳以及少量的锰 (manganese)、硫 (sulfur) 和磷 (phosphorus)。由于脆性过高而无法以其它方法成形, 铸铁一般用铸型 (mold) 铸造成型。其脆性是由高的含碳量引起的, 而高的含碳量同时也提高了铸铁的强度。

6. Iron, carbon and silicon (silicon) alloy is essentially iron, which component is iron, 2% -6.67% of carbon and small amounts of manganese (manganese), sulfur (sulfur) and P (phosphorus). Due to

the high brittleness and can not be otherwise shaped, usually with iron mold (mold) casting. Brittleness is caused by the high carbon content, and high carbon content also improves the strength of cast iron.

三、识图并选择与图示对应的说明 (每空 2 分, 共 14 分)

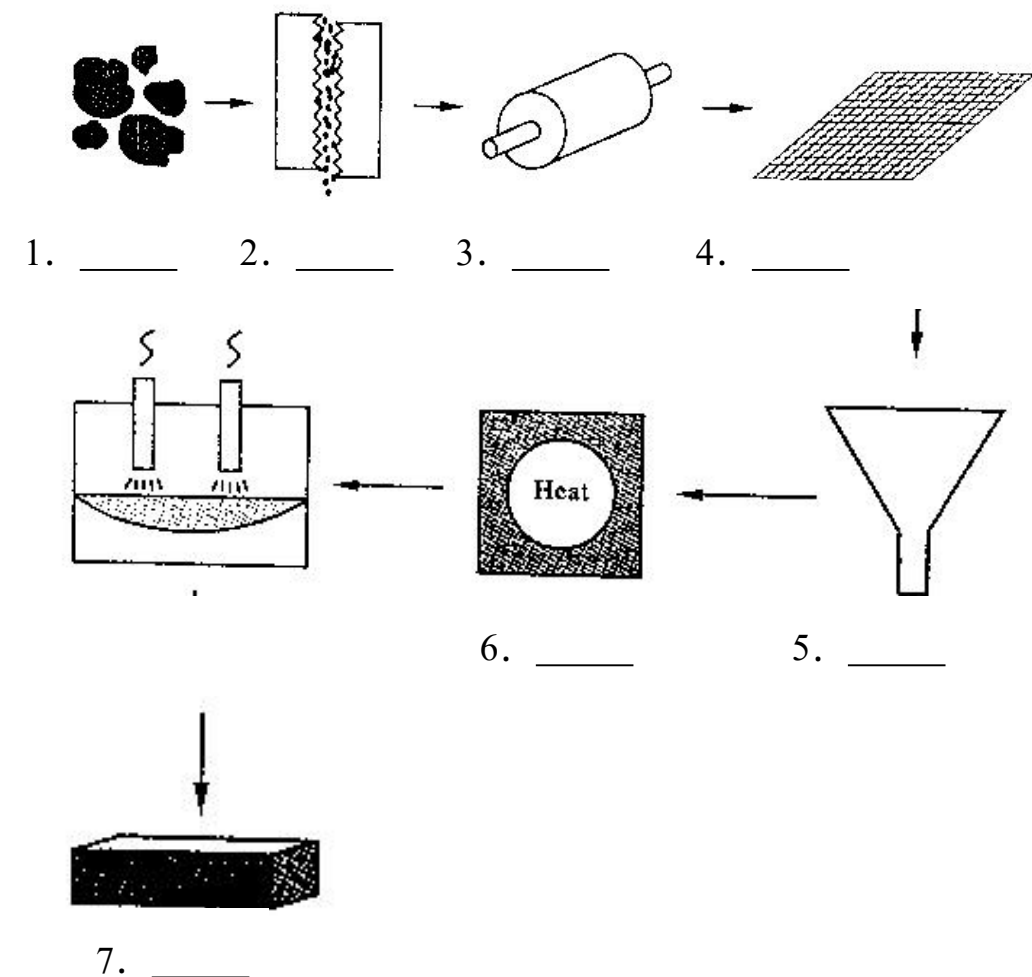


图 Aluminum production process

A. Alumina precipitate B. Dryer C. Impurities filtered out

D. Crushed and washed E. Aluminum ingots F. Bauxite ore
G. Mixed with lime and soda ash

四、根据句子意思选择合适的词语（每空 1 分，共 10 分）

1. When steel is cast into _____, the size of the products that can be made from the ingot is limited. Realizing this, a _____ process has been developed, which removes the size restriction on the ingots.
2. Limestone（石灰石）is used as a blast furnace _____ to remove such _____ as sulfur and silica.
3. _____ contains too much carbon and too many impurities to be used directly in most applications. It must be converted to _____ in one of several types of converters.
4. Low alloy steels are steels with varying _____ contents up to about 1% and with total _____ contents below 5%.
5. As with other steels, stainless steel may be _____ or cast. Wrought stainless steel is grouped by its structure as ferritic, _____, austenitic, and PH.

A. slag B. martensitic C. ingots D. wrought E. steel
F. Pig iron G. alloy H. carbon I. impurities J. continuous-pour

五、短文翻译（20 分）

Forging consists of deforming steel by pressure or blows into a desired shape. The forging may be made from an ingot or from a rolled shape. The steel is usually heated to a semisolid state at a temperature over 1090°C. In some cases it is forged cold. It is forced to fill the shape between dies by pressure or blows of the upper die upon the lower one. The shape may be formed more accurately by successive forgings, each

succeeding operation performed with smaller dies closer to the desired final shape. Instead, the final shape may be achieved by machining. Many shapes can be either cast or forged. Economics often determine which method is used. However, forging is preferred if strength of the part is important. Forging improves the mechanical properties of the metal, and produces a stronger, more ductile, more uniform product with smaller grain size than is produced by casting.

After steel cools and is given its final shape, further heating and cooling processes can change the internal structure and thereby impart certain properties. Heat treatment consists of heating, holding the metal at high temperature, and cooling. Even here the rate of heating is not important, except for high-carbon alloyed steels. The metal is held at the upper temperature so that it can be heated to a uniform temperature throughout. The rate of cooling is very important.