Research Article

Nanofabrication of Silicon Carbide and Optical Processing and Inspection of Noncurved Mirrors

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Received 12 May 2022; Revised 13 June 2022; Accepted 27 June 2022; Published 16 August 2022

Academic Editor: Haichang Zhang

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With the gradual development of modern technology, there are still areas that need to be broken through in the field of science. In today’s society, the application range of noncurved mirrors is becoming more and more extensive. The application of aspheric mirrors will not only improve the imaging quality in all aspects but also improve the application of aspheric surfaces in aerospace, military, optics, physics, etc., and enhance economic benefits. Silicon carbide materials can be used in combination with noncurved mirror materials and produced in the market. This paper mainly studies how to prepare silicon carbide nanomaterials and discusses the relevant characteristics of silicon carbide through the preparation of silicon carbide materials. The aspheric mirror is mainly based on the large-diameter, high-precision aspheric mirror manufacturing system as the research background, which provides certain work experience for the follow-up research. Through the background research of the optical system of the aspheric mirror, this paper analyzed the essentials of aspheric processing technology and then combined the related content of the silicon carbide nanometer and the aspheric mirror. Nowadays, with the development of science and technology, the development prospects of silicon carbide nanomaterials are also more and more broad. After the entire production line of silicon carbide material was put into the production line, it has been recognized by the market, and the benefits are very good, bringing great production benefits to people, and it can be produced on a large scale in the future.

1. Introduction

The hardness and strength of silicon carbide material have high indicators in this regard because it has very good specific properties, making it the chemical of choice for many materials. Although silicon carbide has the specific property of high hardness, the high hardness of silicon carbide results in higher process costs. Because the hardness of silicon carbide is high, the grinding wheel will wear more during the grinding process. Therefore, the shortcomings of silicon carbide will be highlighted, making it difficult for the relevant FSGJ machine tools to achieve high precision, resulting in slower workflow and lower efficiency. The accuracy is difficult to improve, which will become a difficult point in the study of silicon carbide mirrors [1]. The complexity of the technical conditions of CCOS makes the actual data and theory quite different, and this problem will be solved in the follow-up. In the preparation process of silicon carbide materials, not only CCOS technology can be used but also other technologies can be used to solve problems, which can improve the accuracy of silicon carbide materials [2]. It can effectively reduce the material loss in the grinding process, improve the precision of the silicon carbide mirror, solve the damage degree of the grinding wheel, and reduce the cost in the preparation process.

The method for polymer-derived silicon carbide foam relates to the technical field of ceramic processing, in particular, to a method for silicon carbide foam ceramics. Zhou used Ni nanoparticles as catalysts to in situ grow silicon carbide nanofibers (SiCNFs) on the surface of carbon fibers by catalytic chemical vapor deposition (CCVD) at 1000°C. He used X-ray diffraction (XRD), scanning electron
microscopy (SEM), transmission electron microscopy (TEM), thermogravimetric analysis (TGA), and vector network analysis. Jana prepared a series of densities (0.035–0.35 g/cm), porosity (87–98%), and thermal conductivity (0.05–0.12 W/m K) using allyl-hydro-poly-carbosilane as a substrate of silicon carbide foam. Based on the fitting of probabilistic material ratio curves, Hu developed the existing ISO piecewise and continuous separation methods for distinguishing two components contained in a double Gaussian surface. Sasi realized a growing number of two-dimensional (2D) materials, including graphene and silicene, but others are only predicted. Here, atomically thin and hexagonally bonded SiC nanoscale grains were observed to temporally assemble in graphene oxide pores in atomic resolution scanning transmission electron microscopy experiments [3]. Tian WB says that traditional pressureless brazing methods increasingly require large SiC components in many industrial applications. In the current study, the Ni-Si-Ti powder mixture contained 0–10 [4]. Dowling examined the formation of SiC trenches by observing aspect ratio and time-dependent etch rate and topography in 4H-SiC substrates. He also investigated the effect of ICP etch parameters on etch rate and morphology, such as RF bias power (25–100 W), pressure (5–15 mTorr), and O₂ flow rate (0.05–0.12 W/m K). Fraga produced a new silicon carbide ceramic membrane. The membrane consists of a unique top layer on a silicon carbide support for oily wastewater filtration. The morphology and chemical surface composition were characterized by scanning electron microscopy and X-ray photoelectron spectroscopy measurements [5, 6]. Silicon carbide ceramics are ceramics made of silicon carbide materials, which are characterized by high high-temperature resistance.

When solving the noncurved mirror grinding technology, many experts have put forward their own solutions to the error problem in the grinding process. Meng used the MOI model to study the effect of pattern errors in the diffraction-limited case using an elliptical cylinder. Graphical errors at low spatial frequencies can alter the intensity distribution, redistribute the local coherence function, and distort the wavefront but have no effect on the overall degree of coherence. The MOI model is benchmarked against the HYBRID and multielectron Synchrotron Radiation Workshop (SRW) codes, showing that the MOI model gives accurate results under different coherence conditions of the beam. Maiorov analyzed data obtained on electrochemical cells switchable between transparent and mirror states. He recently realized a prototype with three optical states: a transparent, translucent, and semitransparent mirror. He implemented the mode of maintaining the mirror state for a long time (more than 2 hours) at the off voltage (power-off state). Mirror-based telescopes hold promise for dynamic spectroscopic diagnosis of the solar disk with the help of imaging spectroscopy, and Kuzin discussed possible advances in solar research related to specific optics applications. Narayan analyzed the lineage of Travancore humans in the colonial era, focusing on three scenarios of expressive egalitarianism: the soulful Enlightenment, the repositioned Advaita, and the radical Siddha Saiva. All 1424 mirrors (356 × 4) are arranged in such a way that the entire reflector functions roughly as a quasi-parabolic mirror with an area of approximately 339 m², with focal lengths ranging from 25 m in the central area to 26.16 m in the periphery. Here, Dhar described a method for developing metal mirrors using diamond turning techniques. He also presented test and characterization results for about 1500 mirrors that meet all optical requirements for MACE reflectors. Sheridan proved the Kontsevich homology mirror symmetry conjecture for certain mirror pairs produced by Batyrev–Borisov’s “double-reflexive Gorenstein cone” construction. In particular, he proved the HMS (i.e., the Calabi-Yau hypersurface in the weighted projective space quotient) of all Greene–Plessor mirror pairs.

In order to solve the problem that silicon carbide materials do not have osteoinductive properties, we describe the motion trajectory of the grinding wheel during nonsurface grinding. As a result, both physical and mechanical properties of SiC optical materials have higher indices compared with other materials [7]. At the same time, SiC material is isotropic, nontoxic, and less harmful to the human body and environment and has excellent radiation resistance [8].

2. Preparation of Silicon Carbide Nanomaterials

Silicon carbide nanotechnology contains two main contents: the first is to study different shapes and structures through different technologies; and the second is to analyze the different structures and properties of silicon carbide materials. Both of them can be converted by the number of graphite cocrystals and the cocrystal overcooling. According to the overlapping content of the two aspects, we can also combine the two technologies to produce more diverse materials.

Silicon carbide has become a symbol of the development of science and technology in the new century. It not only has scientific and physical significance but also has strong scientific vitality in mechanical, biological, new energy, and other aspects. In terms of new energy, it is a new chemical substance for energy conservation and emission reduction, which has scientific and profound physical significance. Silicon carbide has strong corrosion resistance and wear resistance, can be used in car tires, and will enhance the quality of car tires [9]. In chemical reactions, silicon carbide can replace other chemical catalysts, which can reduce the use of chemical reagents. After years of research and discussion, silicon carbide nanomaterials can also be applied in the development of semiconductor materials. Because when silicon carbide is used in semiconductor materials, it will have an effective light source, and the doping in silicon carbide will have a great impact on the optical properties of silicon carbide [10]. The semiconductor performance of silicon carbide has become a hot topic in science in recent years. Adding different impurities to the components of silicon carbide will have different effects. Because after adding different substances, silicon carbide has different
wavelengths. According to the different impurities added, the wavelength of luminescence is changed, and its applicable places are also different, such as biological detection instruments. Different machines can emit different wavelengths and therefore can detect different diseases.

The preparation flowchart of silicon carbide is shown in Figure 1: The preparation process of silicon carbide material is too cumbersome, not only requires the cooperation of various machines but also requires a lot of cooperation between labs and machines. Gypsum is dewatered, followed by heating, pouring, and drying to form a gypsum mold. Silicon carbide sand is removed from impurities, finely ground, slurred, and poured to form a silicon carbide mold. The process steps of the manufacturing flowchart of silicon carbide nanomaterials: the maximum bulk density must be achieved on the first-level equipment, and the volume density can be guaranteed under a certain pressure. Silicon carbide bricks are made of wet superfine grinding powder, slurred, poured, and fired at ultra-high temperature. Therefore, these bricks have higher high-temperature fracture strength and oxidation resistance than silicon nitride-bonded silicon carbide bricks [11]. A silicon dioxide film is formed on the surface of the silicon carbide material, which prevents oxygen from entering the internal structure of the silicon dioxide material.

The one-dimensional silicon carbide material preparation method is shown in Figure 2. According to the growth mechanism, it can be divided into four categories: the first is the combination of solid, liquid, and solid; the second is the combination of gas and solid; the third is gas, liquid, and solid; and the fourth is oxide-assisted growth mechanism.

The three types of silicon carbide and the corresponding components are shown in Table 1. Silicon carbide mainly contains three categories: green silicon carbide, black silicon carbide, and metallurgical silicon carbide. These three types mainly contain silicon carbide, solid silicon, and silicon nitride. The impurities in the silicon carbide material contain silicon dioxide residues. The silicon dioxide may have deoxidation properties and is not easily corroded by other metal objects in the air. It can protect other important chemical substances in silicon carbide materials, reduce the loss of items, reduce the cost of materials, and improve the efficiency of producing products. Ferric oxide is a good catalyst. It is mainly formed by the chemical reaction of iron when it comes into contact with air and moisture in a humid environment. Aluminum trioxide is a white crystalline powder that easily absorbs moisture in a humid environment. It can be used in ceramics, lasers, optics, etc., but it is an irritating item [12, 13].

2.1. Silicon Carbide Nanomaterials. The tetrahedral structure of silicon carbide is shown in Figure 3, which mainly has three silicon atoms. Through the combination between silicon and carbon, the combination between carbon and carbon, and the combination between silicon and silicon, the silicon carbide tetrahedral structure diagram is formed. The tetrahedrons share edges to form a plane body and connect with the next layer of tetrahedra at vertices to form a three-dimensional structure.

The schematic diagram of the hexahedral structure of silicon carbide is shown in Figure 4. The schematic diagram of the hexahedral structure of silicon carbide contains fourteen silicon atoms and four carbon atoms. Since carbon and silicon form different sequences, different structural schematics can be formed.

2.2. Excellent Comprehensive Properties of One-Dimensional SiC Nanomaterials. Silicon carbide materials have many excellent properties and hence are widely favored by a majority of scientific researchers. Due to the high mechanical strength of silicon carbide material, it can prevent the material containing the silicon carbide material from being deformed and has a wide range of applications. Compared with some steel structure materials on the market, silicon carbide material not only has great hardness but also the surface of the material is relatively smooth and has a low coefficient of friction. The compositional structure between atoms and molecules can be used to analyze the use of limited molecular and atomic structures to form new materials. However, at present, the research on the arrangement and combination of silicon carbide, the microstructure combination diagram, the growth mechanism, and the physical, chemical, and biological properties are in the initial stage. Researchers need to conduct in-depth research on all aspects of silicon carbide and have a thorough understanding of this aspect in order to improve efficiency when carrying out work. By reducing the cost of the materials consumed, manufacturers can carry out mass production after all aspects of work are carried out in the factory. Silicon carbide nanomaterials achieve stable performance, and through better removal of impurities, the purity of the extract can be improved.

2.3. Growth Mechanism of SiC Nanowires

\[
\text{SiO}_2(g) + \text{Ni}(l) = \text{Si}(l) + \text{NiO}(s)
\]

Silicon oxide and liquid nickel produce liquid silicon and nickel oxide.

\[
\text{Si}(l) + C(s) = \text{SiC}(s)
\]

Liquid silicon and solid carbon react to form solid silicon carbide.

\[
\text{SiO}_2 + C = \text{Si} + \text{CO}_2↑
\]

Silica and solid carbon react to form solid silicon and carbon dioxide gas.

\[
\text{SiO}_2 + 2\text{C} = \text{SiC} + \text{CO}_2↑
\]

Silicon dioxide reacts with the two solid carbons to form solid silicon carbide and carbon dioxide gas.

Silicon carbide nanomaterials have natural carbon crystal characteristics, so many kinds of carbon nanotube materials can be prepared. Carbon nanotubes can be stacked...
in a certain number to form silicon carbide nanowires, which are spirally formed by one or more layers of graphite sheets [14]. The related products of silicon carbide materials have many excellent characteristics. Silicon carbide-related materials have quickly entered the market and are widely loved by the public.

**Figure 1**: Preparation flowchart of silicon carbide.

**Table 1**: Composition of various silicon carbide materials.

| Material               | SiC  | SiO₂ | Fe₂O₃ | Si  | Al₂O₃ | Si₃N₄ |
|------------------------|------|------|-------|-----|-------|-------|
| Green silicon carbide  | 98.6 | 0.36 | 0.08  | 0.08| 0.05  | 0.03  |
| Black silicon carbide  | 97.5 | 0.6  | 0.2   | 0.18| 0.05  | 0.05  |
| Metallurgical silicon  | 94.3 | 0.52 | 0.13  | 0.72| 0.37  | 0.06  |
| carbide                |      |      |       |     |       |       |

Forced drying

**Figure 2**: Growth mechanism and types of silicon carbide.

**Figure 3**: Schematic diagram of the tetrahedral structure of silicon carbide.
2.4. Application of SiC Nanomaterials in Mirror Fabrication.
In China, the control of the surface shape error of the workpiece requires a large amount of capital and high technical requirements for personnel. In order to obtain a better compensation effect, it is necessary to better solve the key issues such as establishing a compensation model, model accuracy, and applicability. To achieve high-precision tool setting, the machined part of the grinding wheel must be sharpened, but the grinding wheel wears too fast, which is not conducive to precision control. Surface roughness, subsurface damage, and other indicators will affect the processing volume and processing difficulty of subsequent grinding and polishing. It can be seen from this that there are many technical difficulties in using grinding technology to realize aspheric surface forming, and it is impossible to complete without special technical personnel. Silicon carbide materials can be applied in various aspects in combination with noncurved mirrors, not only can the excellent characteristics of silicon carbide materials be exhibited, but also the characteristics of noncurved mirrors can be used to better develop the excellent characteristics of products. The errors that occur in the grinding of noncurved mirrors are mainly due to the low precision of the ground surface structure during the production process of the factory.

3. Processing and Testing of Noncurved Mirrors

3.1. Research Status of Aspheric Grinding Technology. The large-diameter SiC off-axis aspheric mirror takes the Z axis as the rotation axis, and the equation of the mother mirror is determined from the surface line to a number of high-order equations:

\[
Z = f(x, y) = \frac{c \cdot (x^2 + y^2)}{1 + \sqrt{1 - (1 + k) \cdot c^2 \cdot (x^2 + y^2)}} + \alpha_1 \cdot (x^2 + y^2) + \alpha_2 \cdot (x^2 + y^2) + \alpha_3 \cdot (x^2 + y^2) + \alpha_4 \cdot (x^2 + y^2).
\]

In formula (5), \(c = 1/\tau; \ r = 830 \ mm\) is the vertex curvature radius; \(\alpha_1, \alpha_2, \alpha_3, \) and \(\alpha_4\) are high-order aspheric coefficients; \(k = 0; \) and the off-axis amount is \(207 \ mm.\) Cracks will not occur during the process, but the material removal thickness needs to be less than the critical value of the transformation from plastic removal to brittle removal, so this requires high dynamic stiffness of the machine tool.

3.2. Processing Flow of Noncurved Mirrors. The processing flow of aspheric mirrors is as follows: the first step is aspheric grinding and then grinding by a robot; the next step can only be carried out when the three-coordinate contour is used to detect whether it is qualified. After passing the inspection, it is trimmed through the polishing and grinding technology of the robot; and the final step is to perform interferometry for detection.

The working environment of the space optical system has a great influence on the mirror, which is the frequently changing ambient temperature. According to the heat conduction theory, the amount of thermal deformation of the mirror is inversely proportional to the thermal stability coefficient of the material. When a mirror of the same size absorbs the same amount of heat, a material with a higher coefficient of thermal stability will experience less thermal deformation. It can be seen that the space optical parts are prepared by selecting materials with a high thermal stability coefficient, which can keep the space mirror stable in size under complex working environments and ensure a good working state. The ideal space mirror material should have outstanding physical, mechanical, and thermal properties. It is suitable for mechanical processing and can adapt to the drastic changes of the space environment and, at the same time, can obtain better economic benefits.

The processing flowchart of the noncurved mirror is shown in Figure 5. It is necessary to remove the traces on the aspheric surface and lay the foundation for the subsequent preparation. To the extent that the off-site office is required, the aspheric surface shape needs to be polished. After several processes, the specifications of the entire process can be completed, the requirements of the factory can be met, the quality assurance can be obtained, and the market can be recognized.

3.3. Advantages of Aspheric Mirrors. Aspheric optical parts have the following advantages: aberration correction, improved image quality, enlarged field of view, etc. In military equipment such as thermal imaging equipment and military laser equipment, high-precision aspheric optical parts are applied to varying degrees.

The processing of silicon carbide aspheric mirrors, including spherical and aspherical lenses, is presented in Figure 6. It introduces the processing technology of mirror surface and related processing principles. The grinding process of the mirror mainly includes three steps: rough grinding, semifinishing, and fine grinding. By controlling the size and size of the grinding disc, it is classified into different grinding processes, and different silicon carbide mirrors are produced with different sizes and shapes. Different kinds of
mirrors are studied through different basic principles and methods. Different types of silicon carbide mirrors can be applied in various fields, such as mechanical engineering, physics, chemistry, biology, and other subjects. By controlling the grinding time, the precision of the ground items can be achieved to a higher level, thereby improving the efficiency. It can also shorten the preparation time and reduce the labor cost.

3.4. Technical Difficulties of Aspheric Grinding and Forming Technology. Modern science and technology have many standards, including high efficiency and low cost. However, in the process of processing, due to the high hardness of the aspheric surface, it is not conducive to cutting. Moreover, since the curvature of each aspheric mirror is different, this makes cutting more difficult, which also reduces efficiency and increases costs and sometimes even cut with diamonds. Since the curvature is different for different silicon carbide mirrors, the cutting methods are also different, which invisibly increases the cutting cost. Some aspheric mirrors are not symmetrical or spherical, such as ellipsoid, hyperboloid, or parabola, which will increase the difficulty of the process and increase the cost. The related products of aspheric mirrors are used in many optical lenses. In optical systems, there are special locations for other types of aspheric mirrors. There are two types of optical mirrors: aspheric surfaces with a pair of aberration-free points and aspheric surfaces without aberration-free points, both of which are used in optical systems. It can be seen from this that there are many technical difficulties in using grinding technology to realize aspheric surface forming, and it is impossible to complete without special technical personnel. Therefore, this paper studies the use of CCOS grinding technology, overcomes the shortcomings of aspheric grinding and forming technology, and grinds the initial spherical surface of the ground mirror to obtain the desired aspheric surface. Therefore, the use of CCOS grinding technology is studied to overcome the shortcomings of aspheric grinding and forming technology, and a ground mirror is formed.

3.5. Analysis of the Grinding Process of CCOS. The CCOS grinding process uses a grinding disc that is much smaller than the workpiece. Under the control of the computer, the process parameters used in the control remain unchanged to ensure that the material removal rate per unit time is consistent. According to a specific path, the dwell time of the grinding disc on the workpiece is controlled by changing the speed of the feed axis of the machine tool, so as to accurately
control the amount of material removed, improve the surface shape accuracy, make the surface shape error converge, and finally meet the accuracy requirements. Using the CCOS grinding process to grind aspheric optical parts can realize that the grinding disc can effectively follow the curvature change of the surface of the aspheric mirror, so that the grinding disc and the surface of the aspheric optical parts are well fitted, thereby improving the stability of the removal function to meet the characteristics of deterministic removal.

This article is mainly based on the material properties of silicon carbide, using the working principle of CCOS to grind related materials. According to the working principle of different grinding machines, it carries out reform and innovation, processing, polishing, and grinding the products produced [15]. CCOS technology overcomes the defects of low polishing accuracy, poor surface quality, and low efficiency and has made innovations and improvements to the technology to be more suitable for development and marketing. Sometimes the degree of grinding is large, which will cause the grinding strength to be too high, resulting in damage to the material. The relationship between the removal function and the grinding amount can be used to control related data, which can reduce errors in operation, increase accuracy, improve efficiency, and reduce product loss in the production process, thereby saving materials, reducing costs, and achieving a reasonable allocation of resources. Before production, you can use the model to perform related simulations to avoid errors and make the production process smoother. In the process of processing, with the method applied by CCOS, various items on physical machinery can be processed. More precise calculations can be achieved through computer-savvy calculations. To make full use of the CCOS process, it is necessary to ensure that the speed of the gears during the grinding process is faster to avoid errors [5]. Various types of software on the computer can be used to check the errors in the car processing and solve them according to the places where the errors occur. The workflow of CCOS grinding technology is presented in Figure 7.

Then, the theoretical model of the grinding removal function is as follows:

\[
R(kpw) = \int \theta[\rho(1 + f) + rfe - 2rfe(1 + f)\cos \beta]dp \\
\in [0, (1 + er)], \theta = \arccos 2per + (e_2 - 1)r_2.
\]

However, compared to the processing of silicon carbide aspheric mirrors, even CCOS technology will have some things that cannot be done. In the process of processing, there will be some defects on the edge of the aspheric mirror. When these conditions occur, the efficiency of the process will be reduced, the accuracy of the surface shape will be affected, and the performance of some optical systems will be seriously affected. There will also be certain requirements for the selection of abrasive tools because if the quality of the selected abrasive tools is not satisfactory, it will affect the quality of the output products. This affects not only efficiency but also the placement of the product on the market. When the polishing technology cannot meet the requirements, it will affect the quality of the product and reduce the efficiency of the production product.

3.6. Research Status of Grinding Technology

\[
AB = \iint_{cp} (x, y) dx dy = N, \\
\% \quad AB = \iint_{exp} (x, y) dx dy = O.
\]

Here, \(p(x, y)\) is the pressure in the two regions B and C, respectively; N is the pressure exerted by the grinding disc on the workpiece, which is a constant; and the size \(S\) can be empirically set to \(2S = (r_2)(tr_2 - t)\), where \(r_2\) is the radius of the grinding disc and \(t\) is the exposed edge amount of the grinding disc.

In the actual processing process, the amount of exposed edge of the grinding disc varies. During processing, the size of the grinding disc is fixed, but the size \(S\) varies with the size of the grinding disc and the amount of exposed edges; that is, \(2S = f(t) = (r_2)(r_2tr_2 - 1)\).

When the pressure of the grinding disc on the surface of the workpiece is constant, the function \(S = f(t)\) is derived from \(t\), and it is set equal to 0, and \(t = r_2/2\) is obtained; that is,
when the exposed edge of the grinding disc is half of the radius of the grinding disc, the width of $S$ is large.

In general, however, relatively few studies have been conducted on computer-controlled grinding processes in space mirror processing. Hence, it is necessary to conduct in-depth research on the key technologies in the processing of spatial SiC aspheric mirrors by using the computer-controlled grinding process to improve the processing accuracy and processing efficiency of the computer-controlled grinding process.

4. Experimental Data on Inoculation and Associated Functions of Silicon Carbide Materials

This experiment is to analyze the experimental data of the inoculation and associated functions of silicon carbide materials. In the synthesis of molten iron, the precipitation of graphite and the formation of graphite mainly rely on the nonheterogeneous nucleation as a large amount of graphite-nucleating agent in the molten iron. Generally, the range of nonheterogeneous nucleation is expanded by inoculation.

The inoculation effect of silicon carbide is shown in Figure 8, and the nucleation effect of the heterogeneous crystalline core is remarkable. Adjustments with high carbon content are characterized by high saturation. It contains other impurities in the electrolyte but does not increase the steel content of the silicon carbide. In the process of steelmaking in recent years, silicon carbide has gradually become a new process as a deoxidizer. The use of FSGJ machine tool to process aspheric mirrors reduces costs and improves accuracy. And the use of CCOS technology improves the surface line accuracy of noncurved mirrors, and the technology is also constantly improving. Drawing on successful experience at home and abroad, silicon carbide has been researched into a new type of deoxidizer with low cost and better effect and has begun to replace other deoxidizers in the market. Silicon carbide has broad application prospects and great development potential and has been familiar to more and more people.

This article mainly studies the background of silicon carbide and noncurved mirrors, as well as the preparation of silicon carbide nanometers and the optical processing and inspection process of noncurved mirrors. Using the excellent characteristics of nano-silicon carbide and noncurved mirrors, they can be applied in various aspects by combining with other materials, bringing convenience to people. This paper mainly summarizes the related content of silicon carbide and noncurved mirrors, and the researchers further study them and apply them to a wider range of fields. It mainly studies the high temperature resistance, erosion resistance, and wear resistance of nano-silicon carbide and overcomes the difficulty of silicon carbide being oxidized in the air. The noncurved mirror is a relatively thin curved surface, but the grinding surface shape may not be accurate enough during the grinding process. From the conclusions of the current workshop experiments, it can be known that silicon carbide has increased carbon content and silicon content, which can increase the hardness of articles containing silicon carbide. Silicon carbide has great deoxidation potential, which can increase the hit rate of manganese oxide. It has relatively good deoxidation performance, is convenient and simple to operate, can prepare deoxidizers in daily life, and can meet people’s quality requirements for deoxidizers. A reasonable content of silicon carbide in the item can also increase the hit rate of steel and enhance the hardness of the item. Silicon carbide materials can also be used in recarburizers to reduce the amount of carbon in daily life, which can protect the environment, save energy, and reduce emissions, carbon emissions, and the cost of chemicals. Deoxidation performance of silicon carbide can improve economic benefits, which is conducive to promotion in the market. It contains other impurities in the
electrolyte but does not increase the steel content of the silicon carbide. In the process of steelmaking in recent years, silicon carbide has gradually become a new process as a deoxidizer [16]. Drawing on successful experience at home and abroad, silicon carbide has been researched into a new type of deoxidizer with low cost and better effect and has begun to replace other deoxidizers in the market. Silicon carbide has broad application prospects and great development potential and has been familiar to more and more people.

5. Conclusion

Today, silicon carbide materials are used in various aspects, such as in new energy vehicles. These are not only for energy saving and emission reduction but also conducive to environmental governance. Silicon carbide materials have entered a rapid transition period in all walks of life and have begun to gradually enter the penetration period. Foreign countries have produced relatively advanced silicon carbide materials before China, and China has gradually put into production after understanding the knowledge related to silicon carbide materials. Silicon carbide devices can improve the performance and lightweight of automobiles. Charging anxiety has also become a problem faced by many citizens, and silicon carbide devices can solve such problems. Silicon carbide melts faster in the furnace and has a higher absorption rate, but it also leaves some silicon carbide particles. The use of FSGJ machine tool to process aspheric mirrors reduces costs and improves accuracy. And the use of CCOS technology improves the surface line accuracy of noncurved mirrors, and the technology is also constantly improving.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare no conflicts of interest.

Acknowledgments

This work was supported by the Project of Natural Science Foundation of Hunan Province (2021JJ40027) and the Scientific Research Project of Hunan Education Department (20B113).

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