

A Report on Internship programme on Smelting and Casting processes at Vedanta Ltd., Jharsuguda

The objective of the internship project was to provide M.Sc. Chemistry students with hands-on experience and knowledge about the smelting and casting processes involved in aluminum production. The students aimed to understand the chemical and physical principles underlying these processes, as well as their practical applications in the industry.

Visit Overview:

During the visit to the Vedanta aluminum plant on dated 21.03.2022 to 26.03.2022, Mr. Subasish Dash, Head of CSR and Mr. Sailesh Singh Bisen, potline process in-charge, who are experts in the field, provided comprehensive insights into the following aspects of aluminum production.

- **Raw Material Preparation:** The students learned about the selection and preparation of raw materials, including bauxite and alumina, essential for the smelting process.
- **Smelting Process:** The students observed the smelting process, where alumina is reduced to aluminum metal using electrolytic cells. Mr. Sailesh Singh Bisen explained the chemical reactions, equipment used, and control parameters critical for efficient smelting.
- **Casting Techniques:** Mr. Ajay Sahoo, Casting house in-charge guided us through various casting methods, including die casting, sand casting and continuous casting. The Students gained hands-on experience in understanding the intricacies of mould preparation, metal pouring, and solidification processes.
- **Quality Control:** The Students are introduced to quality control measures, including chemical analysis techniques and mechanical testing, to ensure the produced aluminum meets industry standards.

Key Learnings during our internship, The Students gained several important insights:

- **Chemical Reactions:** The Students deepened our understanding of the chemical reactions involved in the smelting process, particularly the reduction of alumina to aluminium and the electrolytic reactions occurring in the cells.
- **Process Optimization:** The Students learned about the importance of controlling parameters such as temperature, current density, and composition for optimizing the smelting and casting processes.
- **Safety Protocols:** Mr. X and Ms. Y emphasized the significance of safety protocols in an industrial setting, including the handling of hazardous materials and equipment.
- **Environmental Considerations:** The students are made aware of the environmental impact of aluminum production and the industry's efforts to adopt sustainable practices and reduce carbon emissions.

Conclusion

The internship programme at Vedanta aluminum plant was a transformative experience for all 13 M.Sc. Chemistry students. The Students extend their sincere gratitude to Mr. Subasish Dash and Mr.

Sailesh Singh Bisen for their expert guidance and the opportunity to learn from their vast knowledge and practical expertise.

The students are confident that the knowledge and skills acquired during this internship will prove valuable in their future careers. This experience has not only broadened their understanding of industrial chemistry but has also inspired them to pursue excellence in their chosen field.

A handwritten signature in blue ink, appearing to read 'Sailesh', with a stylized flourish extending to the right.