

From the Editor

Zinc is an important nonferrous metal. Its excellent malleability, abrasive resistance, and anti-corrosion property make the metal has been widely used in various departments contributing to the national economy, especially in the auto industry, construction industry, shipping industry and light industry. However, zinc seldom exists in an elemental form in nature. It normally exists in combination with other base metals such as copper and lead in zinc ores, e.g., sphalerite, smithsonite, zincite, willemite, hemimorphite, etc. The production of zinc thus involves the extraction of special high grade (SHG, 99.995% purity) metallic zinc from these intricately composed zinc ores. Purification of pregnant solution from sphalerite concentrate extraction using sulfate acid to produce zinc oxide was meant to prepare zinc oxide production technology utilizing sphalerite mineral as raw material. The current issue is available within the current publication.

Direct reduced iron (DRI), also called sponge iron, is produced from the direct reduction of iron ore (in the form of lumps, pellets, or fines) to iron by a reducing gas or elemental carbon produced from natural gas or coal. The objective of the process is to drive off the oxygen contained in various forms of iron ore (sized ore, concentrates, pellets, mill scale, furnace dust, etc.), in order to convert the ore to metallic iron, without melting it (below 1,200 °C). Many ores are suitable for direct reduction and the process is comparatively energy-efficient. One of the studies regarding the DRI process has been conducted at the Research and Development Center for Mineral and Coal Technology and is presented in this issue. The process was prepared using iron concentrate pellets and coal as a reductant through three stages, namely drying the experiment feed by slow heating at 150 °C, heating such the feed at 1,200°C, and reducing the experiment feed in an atmosphere of CO/CO₂ at various temperatures of 950-1,200°C. The best metallization occurred at 1,100°C.

Coal is being a major source of fuel in most parts of the world. There is a continued interest in the efficient use of coal and the development of clean coal technologies. This requires a detailed understanding of the fundamental properties of coal, thus making the area of coal characterization of paramount importance. Gasification is a process of thermal conversion of solid carbonaceous materials into a gaseous fuel called syngas. Coal gasification is an efficient technology for a range of systems for producing low-emission electricity and other high-value products such as chemicals, synthetic fuels, etc. Low operating temperature for a gasification process is discussed in this issue. The experiment used a bubbling fluidized bed to proceed the low-rank coal.

As the important energy source in Indonesia either for its industry or power plant, coal reserve is quite plentiful in this country, namely around 28.5 billion tons. In addition to its role in the energy sector, coal also contributes to national development as a revenue stream for the State Budget. According to government regulation no. 9/2012, there are three ways in how the coal sector can contribute to state revenue: land rent, royalty/tax, and sales of mining products. Referring to the national energy mix in 2050, the Indonesia government had issued the National Energy Policy (NEP) that targeted 25% of coal use for such an issue. Anticipating the worries about national coal ability in accommodating the demand from domestic and export needs, the NEP made a policy in restricting coal production. Such a policy is to confirm that the Indonesia coal reserve is competent to comply with the domestic demand for power generation and industry by 2050.

Mineral resources are amongst the most important natural resources that dictate the Industrial and economic development of a country because they provide raw materials to the primary, secondary and tertiary sectors of the economy. The analysis of industrial linkages demonstrates that mining industries are basic to the national economy and produce a significant impetus to its downstream industries, but create weak pull effects in terms of national economic development. Based on a calculation using input-output table analysis, there are four sectors that almost all of its domestic outputs able to fulfill the needs of other sectors in the country. These four sectors have a high downstream linkage to other sectors in the country. The issue of metals mining sector linkage on the national economy is presented in current publication.

Editor in Chief