



Editorial

Looking for New Materials Resources

Mario Sanchez*

Human development is strongly associated to metal and earth materials availability. If these resources were unavailable, human life would be reduced to welfare and comfort. As natural resources are finite and scarce, then development pose a challenge, as current needs in technology require sophisticated materials. We need to look for new alternatives other than traditional to cover such needs.

One alternative is the reuse of solid residues for the recovery of useful materials. Environmentally friendly processes are required to prevent the generation of waste, as well as to recover materials for their reutilization. The term 'zero waste process' is increasingly being used, so every product obtained from their processing can find a use either as a finished product, or as feedstock for other processes.

Recycling should be considered in the primary industry. Peripheral plants can be installed, so the residues generated in several stages of the process can be converted into valuable products. Another way is to return some of the by-products to the mainstream, so these can be reprocessed. In mineral and metal production, several residues such as tailings, overburden and slags are now being reprocessed. The case of copper production is controversial, as natural resources nowadays contain less than 1% of metal, therefore around 99% of material has to be removed and disposed of. If that 99% of materials could be properly processed and used, then it will add value to these resources, before considered waste, as well as will help to reduce the environmental impact of the copper industry.

The secondary industry is currently recovering valuable materials, and great investment in research has been done during the last decades. For instance, investigations around the globe have focused on the recovery of metals and other useful materials from electronic waste (e-waste), which contains high quantities of copper, gold, silver and several other metals. The recovery of valuable materials from e-waste is today called 'urban mining'.

Secondary metal production is much lower and still not competitive with primary production. However, due highly strict environmental regulations taking place worldwide, secondary production is expected to rise during the next years, when the need for metals will increase and natural resources availability will decrease. Some compounds that are generally considered as residues could also be recovered. For instance, iron industry could reuse/process copper tailings and copper slags as their iron content is high. The challenges will be to establish a proper process to recover iron and to reduce the copper content in the alloys, as its presence should be avoided in the steel production process.

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Human being development has followed many challenges. This is one more in their history.

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