

Phosphorous supply by substrates of cobalt-rich manganese crusts

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Phosphorous is an essential nutrient in fertilizers for food production. Mainly the phosphorous supply depends on phosphate rock resources on land concentrated in a few countries. Supporting the world population increase by food supply in developing countries, phosphorous is becoming a critical fertilizer, now. Heavy metal concentrations in the on-land phosphate resources, however, are increasing because of the shortage of good quality ones. On the other hand, inefficient use of phosphorus throughout the food systems is polluting our rivers and oceans causing toxic algal blooms. It is the timing to create a sustainable and heavy metal-free phosphorous supply and recycle model. Marine phosphates have received much attention as heavy metal-free phosphate resources these several years in some countries. The other considerable selection is phosphorous recycle in population concentrated areas. Depending on the social and economic situations of each areas or countries, the suitable phosphorous supply and recycle model is different. The best one for Japan is proposed in the study. A phosphate supply from substrate rocks of cobalt-rich manganese crusts and a phosphorous recycle by biosphere on land and near shore are key processes in the model. Some preliminary considerations are presented.

Keywords: Cobalt-rich manganese crust, Phosphorous, Phosphatization, Substrate rock, Deep-sea mining

