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TITLE: Deep-sea Fe-Mn Crusts from the Northeast Atlantic Ocean: Composition and Resource Considerations

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ABSTRACT:

Abstract Eighteen deep-sea ferromanganese crusts (Fe-Mn crusts) from 10 seamounts in the northeast Atlantic were studied. Samples were recovered from water depths of ?1,200 to ?4,600 m from seamounts near Madeira, the Canary and Azores islands, and one sample from the western Mediterranean Sea. The mineralogical and chemical compositions of the samples indicate that the crusts are typical continental margin, hydrogenetic Fe-Mn crusts. The Fe-Mn crusts exhibit a Co + Cu + Ni maximum of 0.96 wt%. Platinum-group element contents analyzed for five samples showed Pt contents from 153 to 512 ppb. The resource potential of Fe-Mn crusts within and adjacent to the Portuguese Exclusive Economic Zone (EEZ) is evaluated to be comparable to that of crusts in the central Pacific, indicating that these Atlantic deposits may be an important future resource. Keywords: ferromanganese crustsnortheast AtlanticPortuguese EEZresource considerationsseamounts Acknowledgments We thank the Portuguese Science and Technology Foundation (FCT) for financial support through Project PDCT/MAR/56823/2004; FCT also supported a fellowship to S.B.M. (SFRH/BD/22263/2005) co-financed by POCI 2010/EU. Additional support to S.B.M. was provided by a LNEG fellowship. We acknowledge K. Hoernle, the crew and scientific party of Meteor M51/1 cruise as well as the Deutsche Forschungsgemeinschaft (DFG, German Research Council) for funding. We acknowledge J. Girardeau, the onboard scientific team, the University of Nantes and the French INSU-CNRS Institute for the financial support that made possible the collection of the samples from the Tore-Madeira Cruise and for kindly having made these samples available for this work. We also thank the co-chiefs of the TTR-11 Cruise, the onboard team and the UNESCO?IOC TTR Program for the samples collected during the TTR-11 cruise, which was funded by INGMAR Project (FCT). We also thank S. M. Lebreiro, L. M. Pinheiro, R. Dunham, J. Noiva, J. Dias, F. Neves, C. Lopes and M. Mil-Homens for their help and discussions. The editors and two anonymous reviewers are thanked for their contribution to the improvement of this paper.

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