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海拉尔盆地火山碎屑岩的测井响应与应用

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Well logging response to the volcanoclastic rocks of Hailar basin and application

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摘要

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摘要 海拉尔盆地中生界为熔岩-火山碎屑岩-沉积岩系列岩性组合,是测井解释层位.但是精细的岩心岩石类型描述与测井识别岩性的精度不匹配,岩心精细分层厚度往往小于测井分层的最小厚度0.6 m.研究显示,安山岩、熔结凝灰岩、凝灰岩、沉凝灰岩、凝灰质砾岩、凝灰质砂岩和沉积岩等主要岩性具有各自的测井响应,即有特定的岩-电关系模式.交会图可以区分岩性,TH-AC交会图至少可区分出砾岩;PE-RD交会图可把凝灰质砾岩和凝灰质砂岩区分开;K-U交会图可把凝灰质砾岩、粗砂岩和凝灰质粗砂岩区分开.根据岩心岩性特征及其测井响应建立的测井岩石分类可以满足测井解释的精度.按照测井岩石分类进行的岩心分层与测井分层吻合程度达80%以上.测井岩性分层是利用自然伽玛(GR)、补偿密度(DEN)、补偿中子(CNL)和微球形聚焦测井(MSFL)四条曲线进行的.本研究提出的GDCM法是综合测井岩性分层的一种方法,适合于海拉尔盆地以火山碎屑岩为主岩性的测井解释.

关键词: 火山碎屑岩 测井响应 岩-电模式 海拉尔盆地

Abstract: The Mesozoic stratum of Hailar basin, a rock succession dominated by volcanic-sedimentary clastic rocks is focused for well logging interpretation in this paper. However, the detailed petrological classification and discription of the core rock do not match the recognizing accuracy of logging, and the thickness of detailed subdivision of the core rock is less than 0.6 m, the minimum layering thickness of logging. The study suggests that some types of rocks are with certain logging responses respectively, being models of rock-logging in Hailar basin, such as andesite, ignimbrite, tuff, sedimentary tuff, tuffaceous sandstone, tuffaceous conglomerate and sedimentary rocks. Some types of rocks can be separated from the others in the crossplots. The crossplot of Th-AC may separate conglomerate from others at least, the crossplot of PE-RD may separate tuffaceous conglomerate and tuffaceous sandstone from others, and the crossplot of K-U may separate tuffaceous conglomerate, coarse sandstone and tuffaceous coarse sandstone each other. The logging rock classification can meet the requirement of logging interpretation, based on both the core rock and its logging response. The core rock layering has been done under the logging rock classification, and the coincidence between them is more than 80%. Four curves of logging including GR, DEN, CNL and MSFL are used in litho-logging layering. The method of GDCM, a way of integreted litho-logging layering, is effective in the logging interpretation of volcanic-sedimentary clastic rocks in Hailar basin.

Keywords: Volcanoclastic rock Response of logging Models of rock-logging Hailar basin

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