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内蒙古锡林浩特—东乌旗剖面壳幔电性结构研究

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The crust-upper mantle electrical structure along Xilinhot-Dongwuqi section

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摘要 为研究二连—东乌旗贺根山一带成矿构造环境,提供矿产资源勘查、预测、评价的地质背景依据,跨贺根山和锡林浩特板块缝合带一线布设了26个超宽频带长周期大地电磁测深点,点距3~6 km,剖面长度100 km,在对获取的资料采用Robust变换、互参考处理的基础上,定性分析了视电阻率和相位曲线、二维偏离度、电性主轴,并采用二维共轭梯度反演技术,解剖了沿剖面120 km深度的地壳、上地幔电性结构特征.反演结果表明,沿剖面以贺根山和锡林浩特缝合带为界分为壳幔结构差异较大的四大构造单元:锡林浩特缝合带南壳内高导层埋深约在25 km,存在深达90 km的高阻块体;贺根山缝合带北壳内高导层埋深约15 km,莫霍面埋深约在50 km;两缝合带之间没发现壳内高导层,地壳表现为相对完整的高阻体;贺根山缝合带为两条岩石圈断裂控制,宽度约15 km,分布有串珠状局部南倾的高导体和上地幔局部隆起,下地壳底界约在25 km,上地幔高导层深度约在55 km,古亚洲洋壳向南俯冲迹象明显;锡林浩特缝合带盖层下宽度约6 km,与壳内高导层连通.缝合带位置均具备壳、幔源物质向上运移的通道,其控制的次级断裂构造系统具备成矿流体聚集、运移、沉淀成矿的有利条件,具备良好的成矿远景.

关键词: 超宽频带大地电磁测深 锡林浩特—东乌旗 缝合带 反演建模 成矿预测

Abstract: In order to provide the geologic background for exploration of mineral prediction and evaluation over Dongwuqi Hegen mountains, 26 long-period MT site was laid out with 3~6 km station spacing,along a 100 km profile. Some data processing techniques including robust transform and cross reference were used, together with analysis of resistivity and phase curve,skewness and regional strike, 2D NLCG inversion was also carried out. On the basis of above analysis, the electrical structure character of crust and upper mantle at depth 120 km of Hegenshan ophiolite melange belt is presented clearly. The research results show that there are four structure units divided by plate suture zones across the profile, the crust and upper mantle structures of those units are very different. South Xilinhot plate suture zone has the high conductivity layer of crust about 25 km below the earth surface, and with low conductivity geologic body for 90 km depth. The high conductivity layer in the north of Hegenshan plate suture zone is about 15 km deep, the Moho depth is about 50 km. There is no high conductivity layer between the two plate suture zones, on the other hand the crust is an integrated high resistivity body. Hegenshan plate suture zone is controlled by two lithosphere faults, and is about 15 km wide with three south-dipping high conductivity bodies. Some regional high resistivity bodies and upper mantle uplift exist,with the crust bottom at about 25 km, and the high conductivity layer in upper mantle at depth of 55 km; The width under cover layer of Xilinhot suture zone is about 6 km, connected with high conductivity layer in crust. There are channels for the crust-mantle source material upward migration under the continental suture zone. The secondary fault system controlled by the suture belt has some beneficial conditions for aggregation,migration and mineralization, and with good mineralization prospect.

Keywords: Wideband MT Xilinhot-Dongwuqi Continental suture belt Inversion model Metallogenic prediction

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