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Oil shale characteristics of Danzhou in Hainan Province

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The Danzhou oil shale deposits are located in the Changpo Township of Danzhou City in the Hainan Province. The exploration area of the mine is 58 km². The Danzhou oil shale deposit is one of the largest in China. The oil shale bearing area lies in the south of the southern depression of the Beibu-Gulf Basin. There are seven small faults that have been identified by drilling in the Changpo Formation. The faults are nearly planar and distributed trending EW on the plane and converge to the west. Oil shale is developed mainly in the Miocene Changpo Formation. Oil shale alternating with lignite is developed mainly in the 4th member of the Changpo Formation and shows a monoclinical structure in the south of the basin. Oil shale beds are very continuous along the strike direction, naturally thinning-out toward the east and west. Oil shale thickens northward along the inclination direction and thins out to the deep. Oil shale bed 1 has alternating lignite layers with an average oil shale layer thickness of 6.0 m, average oil yield of 5.2%, and average caloric value of 7.32 MJ/kg. The average thickness of oil shale bed 2 is 44.5 m (the thickness in this layer is fairly constant), an average oil yield of 5.1%, and an average caloric value of 5.29 MJ/kg. The average thickness of oil shale bed 3 is 4.6 m, with an average oil yield of 4.2%, an average ash content of 79.5%, and average caloric value 4.20 MJ/kg. During the sedimentary period of the Changpo Formation, the basin had a continental lacustrine-swamp environment under a warm and humid climate. From this it formed mudstones, lignite, and oil shale from the 2nd to 5th member. At the same time, the Mahuang Range in the north of the basin deposited thick piedmont which accumulated with variably colored crude clastic materials to make up a majority of the formation. The exploration finished 225 geological exploration drill holes totaling 50,420 m. Special hydrological drilling finished at a depth of 2370 m. Significant test work was also conducted on over 6100 samples. The oil shale resources in the Danzhou oil shale deposit are estimated to be 2.62×10⁹t.