Method for processing pyrolusite manganese ore involves thermal treatment of manganese ore using spent ferric chloride pickling solutions. The processing is carried out in three stages, where in the first stage, pyrolusite manganese ore is treated with spent pickling solutions at a molar ratio of MnO_2 : $FeCl_2$ = 1.0 : 2.0-2.2, pulp is dried at 100-105 °C, salts are calcined at 170-250 °C, and hydrochloric acid is regenerated — $MnO_2+2FeCl_2+H_2O=MnCl_2+Fe_2O_3+2HCl$; in the second stage, manganese(II) chloride is pickled with hydrogen, and in the third stage, manganese(II) chloride solution is separated from iron(III) oxide precipitate and sand by filtration, and iron(III) oxide is separated from sand by magnetic separation.