

论文

脱水天然气输送管道腐蚀失效分析

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摘要:

川东油气田天然气集输管道多次出现管道破裂穿孔等事故。利用X衍射、扫描电镜、电子探针、热重分析等方法对现场的腐蚀挂片和集输管道中收集的腐蚀产物进行了分析检测。结果表明:集输管道虽然经过三甘醇脱水工艺处理,仍遭受较严重的H2S腐蚀,腐蚀形态主要为局部坑蚀;集输管道中形成的腐蚀产物成分比较复杂,主要为FeS, FeS2, Fe3S4和Fe9S8,同时存在一定量的铁的氧化物和其它化合物;管道中腐蚀产物的热分析表明,在170℃~350℃温度区间,存在一个强放热反应,热焓值ΔH为-256.8J/g,该反应可能为FemSn转化为FexOy反应。

关键词: 脱水 腐蚀产物 X-衍射 扫描电镜 电子探针

INVESTIGATION OF THE CORROSION OF COLLECTION PIPE OF DEHYDRATED NATURAL GAS TRANSPORT

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Abstract:

New processes of dehydration with triglycol are applied in the transport of natural gas in Sichuan-east Datianchi oil/gas field. Accidents of cracking and perforation still occurred in the collection pipe of natural gas transport. The spot loss-sample and corrosion product collected from the pipe were analyzed with X-ray diffraction, electron probe microscopy analysis (EPMA), scanning electron microscope and thermal analysis. The analysis results show that the collection pipe of natural gas transport suffered severe hydrogen sulfide corrosion though new processes of dehydration had been introduced. The pattern of corrosion showed from loss-sample was pitting corrosion. The composed of FeS, FeS2, Fe3S4, and Fe9S8, some ferrous oxide composition and something else. Thermal analysis of corrosion product sample shows that a strong exothermic reaction exists between 170℃ to 350℃, the enthalpy value(ΔH) is about -256.8J/g.

Keywords: dehydration corrosion product hydrogen sulfide scanning electron probe thermal analysis

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