

## Experimental study on the effect of corrosive gas on N80 steel corrosion under sewage erosion conditions

Meng Jiang<sup>1</sup>

<sup>1</sup> School of Petroleum and Natural Gas Engineering, Chongqing University of Science and Technology, Chongqing-401331

**Abstract** Oil and gas production often encounters the presence of corrosive gases in the effluent and the flow rate reaches the erosion rate. In this case, the sewage pipe is seriously corroded, which seriously affects the operation safety. In this paper, the effects of CO<sub>2</sub>, O<sub>2</sub> and mixed CO<sub>2</sub> and O<sub>2</sub> gases in water on the corrosion of N80 steel were analyzed by using a high-temperature and high-pressure reactor under the erosion rate of sewage erosion. The results show that the effect of the corrosive gas on the corrosion of N80 steel is in the order of O<sub>2</sub><sup>+</sup> a small amount of CO<sub>2</sub> > O<sub>2</sub> > CO<sub>2</sub> + a small amount of O<sub>2</sub> > CO<sub>2</sub> under the erosion rate of water flow. Due to the erosion of sewage, there are tiny depressions on the surface of N80 steel, and the corrosion surface increases, and at the same time, the diffusion rate of CO<sub>2</sub>, O<sub>2</sub> and CO<sub>2</sub> and O<sub>2</sub> mixed gases is accelerated, which promotes the hydration of corrosive gases, resulting in the reduction of the density of the corrosion product layer and the reduction of the distribution range, which accelerates the diffusion of these corrosive gases in the corrosion product film, promotes the local corrosion of N80 steel, and makes the corrosion change from uniform corrosion to local corrosion.

**Keywords** Erosion Velocity, Corrosive Gases, N80 Steel