Dynamics of reservoir pressure and the influences on coal seam gas production

Introduction

Coalseam gas (CSG) is known as an important unconventional natural gas resource. The dynamic of reservoir pressure are key factors in determining effective desorption range, the interwell interference, and gas productivity. The objectives of this study are to establish a model to calculate the dynamics of reservoir pressure and bottom-hole pressure (BHP) during CSG production and analyse the influences of reservoir pressure dynamic on CSG production.

Methods

A new method was proposed to calculate the dynamics of reservoir pressure with consideration of CSG sorption and production data. Then, with the deliverability equation under pseudosteady-state flow, the variations of BHP were analysed and compared with the production data.

Results and discussion

There are similar variation trends between the reservoir pressure and BHP with calculation that both showed a slow-fast, and slow variation pattern. While the BHP in practice is evidently lower compared with BHP with calculation. There are similar variation trends between the pressure difference with calculation and gas production rate. But the pressure difference in practice is evidently higher compared with pressure difference with calculation.

Conclusion

The controlling of BHP of Well X1 should adapt the variations of reservoir pressure.