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Minimizing gas flaring and enhancing condensate recovery from gas condensate reservoirs through gas injection

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Gas reservoirs can be classified into dry gas reservoirs, wet gas reservoirs and gas condensate reservoirs. In gas condensate reservoirs, the reservoir temperature lies between the critical temperature and the cricondentherm. The gas will drop out liquid by retrograde condensation in the reservoir, when the pressure falls below the dew point. This heavy part of the gas has found many application in industry and also in daily life and by remaining in reservoir not only this valuable liquid is lost but also its accumulation will result in forming a condensate bank near the well bore region which makes a considerable reduction in well productivity.

In this paper, gas injection will be studied in a gas condensate reservoir to increase the recovery factor moreover the capability of different injection gases (CO_2 , N_2 , CH_4 and separator gas) will be compared through different injection schemes. The injection schemes which will be considered are: different injection rates, different injection pressures and different injection durations. We think that the response

of the reservoir in different cases will be different but that injection of all of them can increase the condensate recovery. As many parameters can affect the decision of selecting the injection scheme, other than the gas and condensate recovery factor, doing an economical evaluation is inevitable to take them all into account and determine the best one.

In this paper, the efficiency of different schemes of gas injection and gas recycling in condensate recovery from a gas condensate reservoir, through compositional simulation has been studied and compared. The effect of changing injection rate, injection pressure and injection duration has been investigated by three injection gases (N_2 , CO_2 , CH_4) and gas recycling. The appropriate and optimum case can be selected considering the results of the simulation work and doing an economical evaluation, taking into account all the parameters such as: the price of the gas and condensate, the price of the injection gases and the cost of the facilities needed in each scheme with regard to the present level.

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