

Design Parameters For the WAG Process

Ali Asghar Shafiei¹

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asgharshafiei@gmail.com

Abstract

In recent years there has been an increasing interest in WAG processes, both miscible and immiscible. Design of WAG process is more complicated than waterflood and gas injection processes, due to existence of three mobile phases simultaneously. Parameters that should be considered for the WAG process include reservoir heterogeneity and stratification, rock and fluid characteristics, injection gas characteristics, injection pattern, tapering (change in water to gas ratio throughout the flood), WAG injection parameters (water to gas ratio, number of cycles, injection rates), flow dispersion effects (relative permeability description for three phases), gravity considerations in WAG and laboratory studies and simulation. Plain gas injection is a WAG process with water to gas ratio of 0:1, hence these design issues are applicable to gas injection design. The popularity of the WAG process is evident from the increasing number of projects and many successful field wide applications. Waterflooding and plain gas injection are two commonly-used EOR methods in Iranian reservoirs, but their associated problems lead to lower production life of the wells. It's been approved that WAG process, in some cases, modifies the demerits of these processes, hence more residual oil is produced. After design of the WAG process pilot tests are required to monitor its performance in the field.

Keywords: WAG Parameters, Heterogeneity, Sweep Efficiency, Gravity Segregation

¹MSc in Petroleum Reservoir Engineering