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USE OF CHITOSAN AS COAGULANT IN TREATMENT OF OILY PRODUCED WATER BY INDUCED AIR FLOTATION

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ABSTRACT

Treatment of oily produced water (OPW) before reuse in injection process and remove to surrounding are necessary to reduce formation damage and pollution. This can be done using induced air flotation (IAF) method to minimize and separate oil from water. Chitosan act as coagulant in this process to enhance the efficiency of oil removal in this process. In this respect, these research objectives are to investigate the affect of pH when changed and to determine the dosage of chitosan required. It was found that the removal of oil by chitosan increase at pH 2 then others. The oil removal by chitosan reached 78.03% and 61.87% at pH 2 and pH 8 respectively. The ability of chitosan to remove oil also decreases after adding aluminium sulfate (alum). Data shows that the highest efficiency of oil removal by mixing chitosan and alum (40% chitosan: 60% alum) is 76.32%. Generally, chitosan has high ability to remove crude oil from OPW and can reduce the cost for water treatment.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND RESEARCH

Oily produced water (OPW) can cause a lot of problems in many aspects such as technical, environmental, and economical in oil and gas production. The presence of OPW can limit the life production of oil and gas wells. OPW also cause other serious problems including fine migratatic loading and corrosion of tubular (Hosny *et al.*, 2016). So, before the OPW being reused in production or remove to the surrounding, it must be treated.

Produced water also can be known as salt water and brine. Oil reservoir is the source of OPW production. The reservoir can be included from above and below the hydrocarbon zone and inside the hydrocarbon zone. According to US National Energy Technology Laboratory (NETL) show in Figure 1, the total production of OPW is increasing about 10 million barrel per day for every 2 years. The ratio of water to oil production is 5:1 and 8:1 in US, and 2:1 and 3:1 for worldwide.

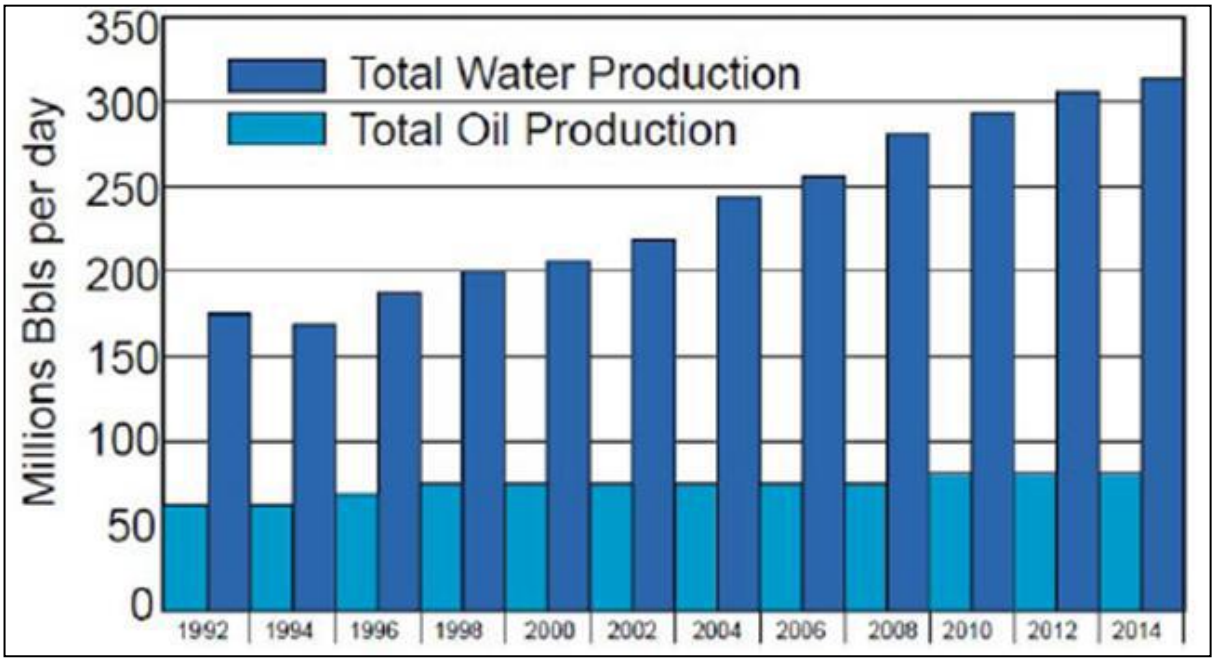

Figure 1Total water productions