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Introductory Chapter: Oil Field Chemicals - Ingredients in Petroleum Industry

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Time is the friend of the wonderful business, the enemy of the mediocre - Alice Schroeder

1. Introduction

The real task for the oil industry is how quickly it can move to take advantage of the many opportunities that “gas and renewable” technologies will bring. While oil demand slowly falls with the adoption of more renewables and gas technologies, there is a need for oil companies to have insight into new technology advancement and accordingly innovate to stay competitive and keep the fuel flowing. A great deal of activities in the oil and gas sector is focused on upstream and downstream, and not surprisingly, research and development still plays a key role in the coming years. Oil companies should be prepared to pursue new drilling and extraction technologies and to increase their research into sustainability and clean energy. I think oil sector leaders might consider a question on how their companies can develop new capabilities and in what areas?

Nowadays, improved oil recovery (IOR) is one of the main strategic priority areas in petroleum industry [1]. IOR processes consist of all techniques that are employed to enhance hydrocarbon production. Oil field chemicals have many positive functions such improved oil recovery, drilling optimization, corrosion protection, prevent mud loss in different geological formations, stabilize drilling fluid in high pressure and high temperature environment, and many others [2]. Oil field chemicals demand is expected to reach USD 32.69 billion by 2023 from USD 26.06 billion in 2017 [3]. The rising demand from Asia-Pacific, shale gas, and increasing deep water drilling operations are likely to be the major driven for the oil field chemicals market.

Region wise, oil field chemicals have received much attention in recent years (**Figure 1**) due to their contribution in oil recovery of hydrocarbons, which offer important economic benefits. Many case studies and lessons learned from the industry show that there are excellent

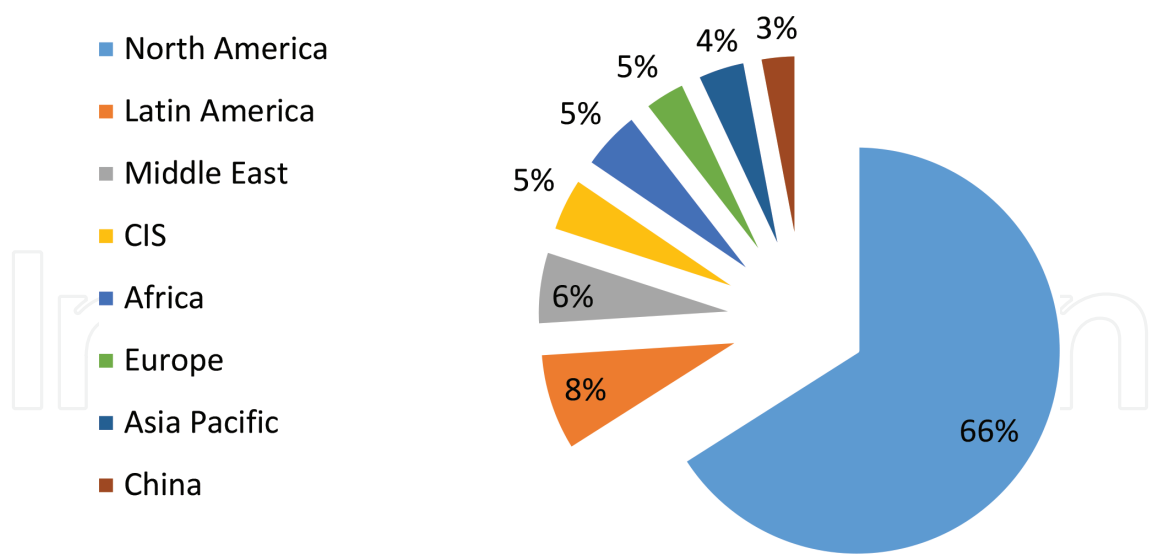


Figure 1. Oil field chemicals by region.

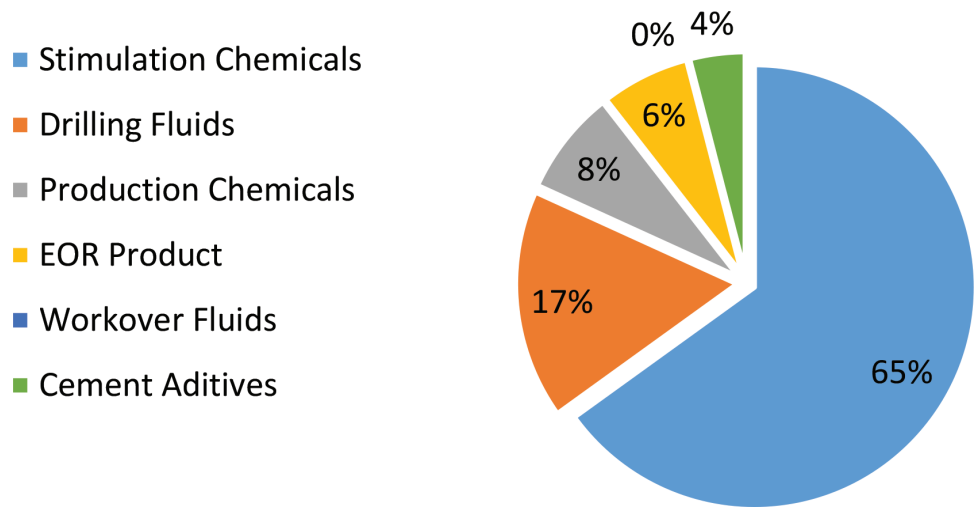


Figure 2. Oil field chemicals market.

opportunities to grow for oil field chemicals in certain fields such as drilling and cementing, enhanced oil recovery, production, workover and completion, and well stimulation. Well stimulation comprises of different types of operations performed on a well to maintain and/or improve its productivity [4].

According to IHS Markit, 2018 [5], oil field chemicals enable the production of oil and gas or make it efficient and is projected to grow at an average annual rate of about 4% during 2017–2022. Logistics (hauling, transfer, and storage) and disposal issues are directly related to the green and continuous development in oil field chemicals. These two are contributed to approximately 85–90% of total annual spending money in petroleum industry.

The wide range of oil field chemicals, including well stimulation and other additives, plays an important role in maximizing the productivity of existing (green) and mature (brown) fields.

Stimulation operations can be conducted solely on the wellbore or on the reservoir; those can be performed on old wells and new wells alike; and it can be designed for remedial purposes or for enhanced production. As shown in **Figure 2**, the market size of the well stimulation in USA alone is about 61% of the total oil field chemicals. Increases in well stimulation activities are expected to continue; accordingly, development and innovation in stimulation chemicals will effectively shape the future of oil industry; that is one of the potentials what the oil and gas leaders may think about!

I am calling oil field chemicals as “every time ingredients” in petroleum industry; they are utilized in many ways and different stages in downstream and upstream sectors, starting from drilling, production, stimulation, and finally abandonment. So, if the oil sector leaders are thinking about innovative solutions in oil field chemicals, TIME is really their friend.

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