Engineering Nanoparticles for Enhanced Oil Recovery

Type of scholarship: Degree seeking PhD

Period of the scholarship: August 2020 – August 2024

Short description of the scholarship:
The continuing increase in worldwide energy demand has motivated recent efforts of bringing nanotechnology into the oil and gas industry. One of futuristic applications of nanotechnology in petroleum engineering is the novel nanoparticles for enhanced oil recovery. However, the understanding, prediction and optimization of nanoparticles for EOR require the knowledge of engineered nanoparticles in a harsh reservoir environment. Furthermore, bore holes are heterogeneous on all length scales, for example the surface roughness, pore size and deformations, which justify a multiscale approach. The PhD project aims to establish a fundamental understanding of the physics of nanoparticles dispersed in confined space by means of multiscale experimental and computational methodologies. The primary objective is to design and control nanoparticles enabling interfacial wettability alteration and enhanced flow transport in confined space towards petroleum applications by atomistic and molecular simulations. Quantifying the effect of nanoparticle size, surface properties, and concentration on their interaction with rock and oil/water phase will broaden the scientific and technological base of nanoparticles for EOR. The established structural-property relationship of nanoparticle and flow transport will provide the guidelines for the design and control of nanoparticles towards the applications in oil and gas industry.

Qualification and requirement:
• The applicant should have completed a master’s degree upon August 2020 with a strong academic background in nanotechnology, chemistry, physics, material science, mechanics or equivalent education with a grade of B or better in terms of NTNU’s grading scale. If you do not have letter grades from previous studies, you must have an equally good academic foundation.

In addition, for all applicants the following applies:

• Fluent English language, both written and spoken with certificates of TOEFL minimum 95 or IELTS minimum 6.5
• Chinese citizenship documents (copy of his/her passport or national ID of P.R. China
• CV

Deadline for submission of application: the 31st of March 2020

Scholarship: 22500 NOK/month after tax for a period of up to 48 months
According to the NTNU-CSC agreement, CSC will provide a living stipend, currently 12,500 NOK per month for a period of up to forty-eight (48) months, and a round-trip international airfare between China and Norway. NTNU will provide a monthly additional funding for a period of up to forty-eight (48) months, which combined with the CSC living stipend ensures the sufficient income (currently minimum 17,000 NOK per month) required by NTNU. No tuition fees will be charged for PhD candidates at NTNU.

**Supervisor info:**
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