

Green valorisation of waste vegetable oil into thermo-responsive nanocomposites for enhanced oil recovery

Shahenda Mahran^{1*}, Attia Attia¹, Basudeb Saha^{2*}

¹Faculty of Energy and Environmental Engineering, The British University in Egypt, Misr-Ismailia Road, El-Sherouk City 11837, Cairo, Egypt.

²School of Engineering, Lancaster University, Lancaster, LA1 4YW, UK.

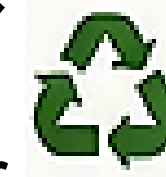
1. INTRODUCTION & AIM



Polymer flooding is an efficient CEOR technique but limited by poor thermal and salinity stability of HPAM.

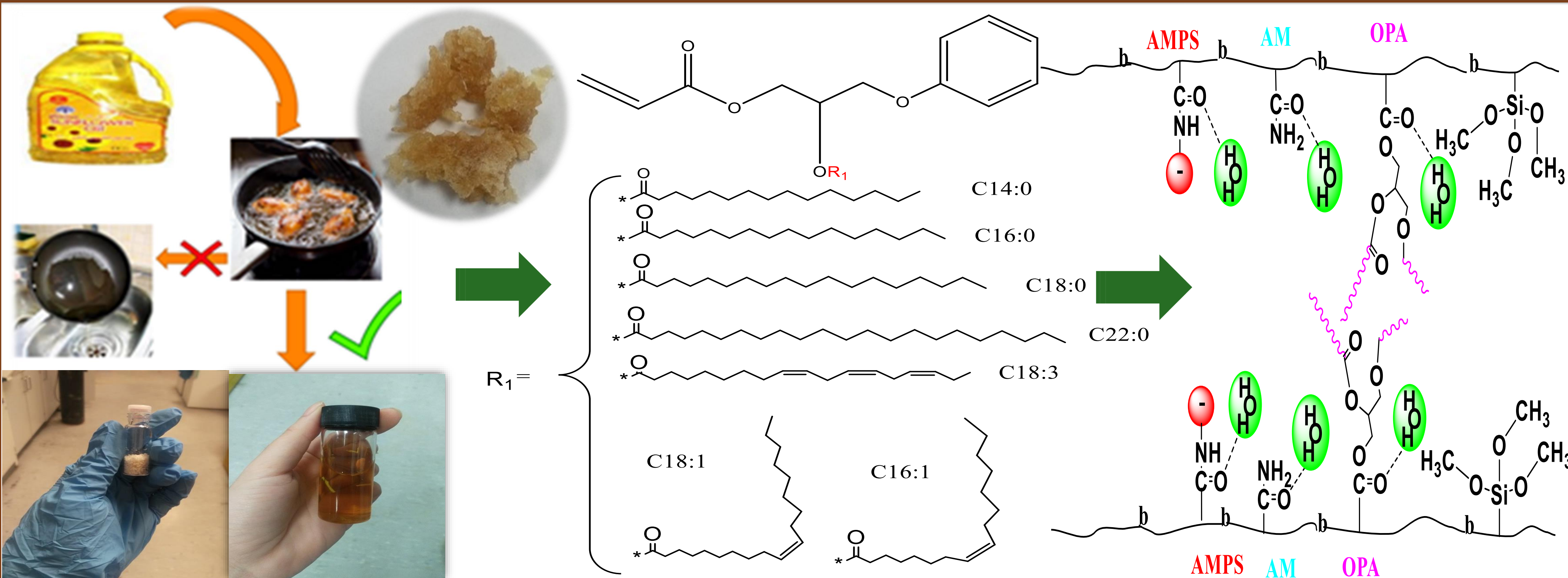


HTHS reservoirs (high temperature & high salinity) demand advanced, stable, and sustainable polymer systems.

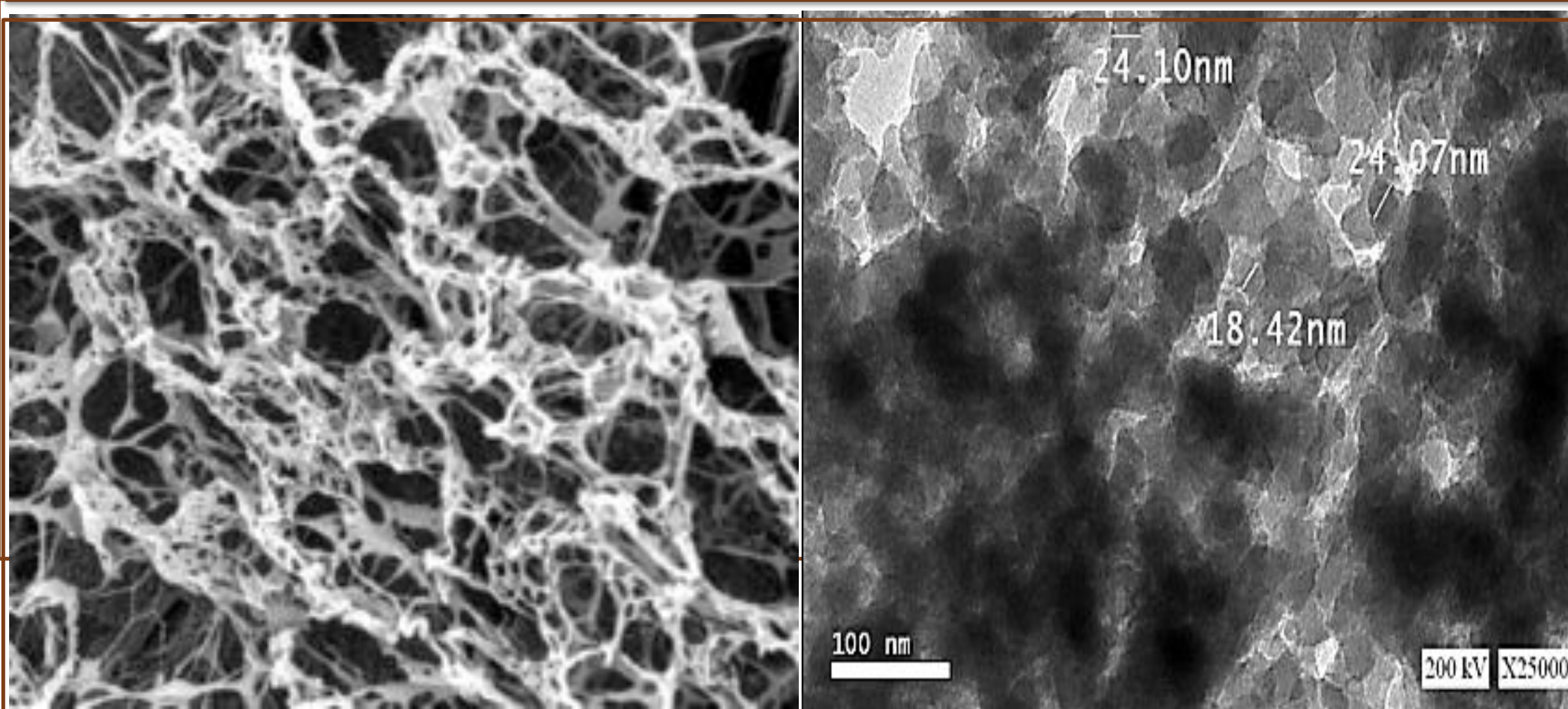


This study valorises waste vegetable oil (WVO) to create a green, thermo-responsive nanocomposite for enhanced oil recovery (EOR) under extreme conditions.

2. SYNTHESIS APPROACH



3. CHARACTERISATION



5. CONCLUSIONS

- Sustainable Nanocomposite:** Derived from waste vegetable oil.
- High Performance:** Achieved 21.2% oil recovery.
- Extreme Conditions:** Effective at 100°C and 250,000 ppm salinity.
- Low Cost:** Efficient at only 0.05 wt.% concentration.

4. RHEOLOGY AND OIL RECOVERY PERFORMANCE

