CLAIMS

1. A surfactant composition comprising an olefin sulfonate, wherein the olefin sulfonate is a propylene oligomer comprising one or more sulfonate groups and wherein the propylene oligomer has an average total branching of 3 to 15 per molecule.

2. The surfactant composition of claim 1, wherein the propylene oligomer is a propylene tetramer, a propylene pentamer, a dimer of propylene tetramer, a dimer of a propylene pentamer, or any combination thereof.

3. The surfactant composition of any of claims 1-2, wherein the propylene oligomer has an average carbon number of from 9 to 50.

4. The surfactant composition of any of claims 1-3, wherein the propylene oligomer has an average carbon number of from 31 to 50.

5. The surfactant composition of any of claims 1-4, wherein the average total branching is from 3 to 10.

6. The surfactant composition of any of claims 1-5, wherein the composition further comprises water, a co-solvent, a base, or any combination thereof.

7. The surfactant composition of claim 6, wherein the co-solvent comprises an alkanol ether, glycol ether, ethylene glycol monobutyl ether (EGBE), triethylene glycol butyl ether (TGBE), or any combination thereof.

8. The surfactant composition of any of claims 6-7, wherein the base comprises NaOH, KOH, or any combination thereof.

9. The surfactant composition of any of claims 1-8, wherein the composition further comprises an unreacted starting material for synthesis of the olefin sulfonate, a byproduct remaining from synthesis of the olefin sulfonate, or any combination thereof.

10. The surfactant composition of any of claims 1-9, wherein the average total branching number is a sum of average total aliphatic branching and average total olefinic branching as determined by NMR.

11. A concentrated surfactant composition comprising:

an olefin sulfonate, wherein the olefin sulfonate is a propylene oligomer comprising one or more sulfonate groups, the propylene oligomer having an average total branching of 3 to 15, and wherein the olefin sulfonate is present in 10 wt % to 95 wt %, based on the total weight of the concentrated surfactant composition.

12. A process for providing a surfactant, the process comprising:

reacting a propylene oligomer with SO_3 in the presence of air to form an olefin sulfonic acid, wherein the propylene oligomer is propylene tetramer, propylene pentamer, dimer of propylene tetramer, dimer of propylene pentamer, or any combination thereof and wherein the propylene oligomer has an average total branching of 3 to 15 per molecule; and

neutralizing or hydrolyzing the sulfonic acid with a base to form a propylene oligomer sulfonate.

13. The process of claim 12, wherein the propylene oligomer has an average total branching between 3 and 10.

14. The process of any of claims 12-13, wherein the monovalent cation comprises sodium, lithium, potassium, ammonium, substituted ammonium, or any combination thereof.

15. The process of any of claims 12-14, wherein mole ratio of propylene oligomer to SO_3 ranges from 0.8 to 1.6.

16. The process of any of claims 12-15, wherein the base comprises a carbonate, a hydroxide, a bicarbonate, an ammonium, an amine, or any combination thereof.

17. The process of claim 16, wherein the base comprises NaOH.

18. The process of any of claims 12-17, wherein propylene oligomer and SO_3 are reacted in a falling film reactor.

19. The process of claim 18, wherein temperature of the reactor ranges from 0 to 80° C.

20. The process of any of claims 18-19, wherein concentration of SO_3 in the reactor ranges from 0.1 wt % to 10 wt %, based on the total weight of all reactants combined in the reactor.

21. The process of any of claims 12-20, wherein the average total branching number is a sum of average total aliphatic branching and average total olefinic branching as determined by NMR.