



Aquatic Plant-derived Changes in Oil Sands Naphthenic Acid Signatures



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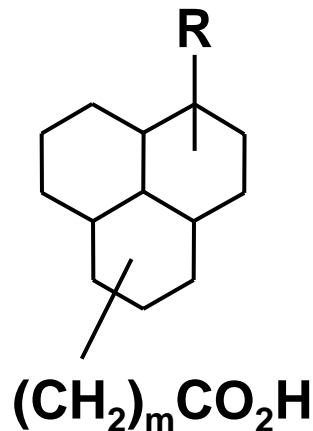
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Naphthenic acids (NAs) are a group of surfactant compounds with the general chemical formula of $C_nH_{2n+z}O_2$ in which n is the number of carbon atoms and z is zero or a negative even number and represents the number of hydrogen atoms lost as the structures become more cyclic. These organic acid compounds contain a preponderance of alkyl-substituted cycloaliphatic carboxylic acids, and, to a lesser extent, acyclic aliphatic acids, and are released from bitumen during the mining of oil sands and the processing of bitumen for oil production. As a result NAs accumulate in the large volumes of oil sands processed water (OSPW) produced at oil sands operations in Fort McMurray, Alberta, Canada. The large volumes of OSPW must eventually be remediated, and natural biodegradation seems to be too slow. Furthermore, the NAs are of toxicological concern in the environment because they have acute aquatic toxicity to a variety of aquatic organisms including fish.



Z = -6

DBE = 4

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