What is claimed is:

1. A process for purifying a dicarboxylic acid comprising

a) ozonizing a mixture comprising an ethylenically unsaturated compound having between 6 to 24 carbons with an ozone-containing gas to form a plurality of ozonization products;

b) cleaving the plurality of ozonization products under oxidative conditions in the presence of a suitable catalyst to form mixed oxidation products, wherein the mixed oxidation products comprise a mixture of C2 to C22 monocarboxylic acids and C2 to C22 dicarboxylic acids;

c) distilling the mixed oxidation products to provide a first distillate comprising a mixture of C2 to C16 monocarboxylic acids, and a first residue of the mixed oxidation products, wherein the first residue of the mixed oxidation products includes the dicarboxylic acid and a mixture of C9 to C22 monocarboxylic acids;

d) distilling the first residue of the mixed oxidation products to provide a second distillate and a second residue of the mixed oxidation products, wherein the second distillate comprises the dicarboxylic acid and a fraction of the mixture of C9 to C22 monocarboxylic acids;

e) partitioning the second distillate between water and an organic solvent, wherein the water is at a temperature within the range of 175°F, 79°C to 230°F, 110°C; wherein the organic solvent is substantially immiscible with water and has a water solubility of less than 0.5 grams per liter at 20°C; wherein the water and the organic solvent are substantially immiscible to thereby form an aqueous layer containing the dicarboxylic acid and an organic solvent layer containing at least a portion of the fraction of the mixture of C9 to C22 monocarboxylic acids; and wherein

f) separating the organic solvent layer from the aqueous layer; and

g) isolating the dicarboxylic acid from the aqueous layer to provide a purified dicarboxylic acid having a residual content of C9 to C22 monocarboxylic acids that is less than 0.5 percent by weight.

2. The process according to claim 1, wherein the residual content of C9 to C22

monocarboxylic acids is less than 0.05 percent by weight.

3. The process according to claims 1 to 2, wherein the organic solvent comprises one or more C6 to C12 hydrocarbon compounds.

4. The process according to any of the claims 1 to 3, wherein the organic solvent comprises hexanes, heptanes, octanes, nonanes, decanes, undecanes, dodecanes, or combinations thereof; or the organic solvent is heavy naphtha.

5. The process according to any of the claims 1 to 4, wherein the organic solvent has a water solubility of less than 0.5 grams per liter at 20°C.

6. The process according to claim 1, wherein ~~the~~ distilling the organic solvent layer comprises:

i) transferring the organic solvent layer comprising the organic solvent and the mixture of C9 to C22 monocarboxylic acids to a first distillation unit, wherein the organic solvent and the mixture of C9 to C22 monocarboxylic acids are separated by forming an organic solvent vapor;

ii) condensing the organic solvent vapor to form ~~the~~ a recycled organic solvent, wherein the content of C9 to C22 monocarboxylic acids in the recycled organic solvent is less than 0.5 percent by weight.

7. The process according to claim 6, wherein the organic solvent vapor further comprises water, which is subsequently removed from the recycled organic solvent.

8. The process according to any of the claims 6 to 7, wherein the content of C9 to C22 monocarboxylic acids in the recycled organic solvent is less than 0.1 percent by weight, or less than 0.05 percent by weight.

9. The process according to any of the claims 1 to 8, wherein the aqueous layer contains less than 1 percent by weight of the organic solvent prior to any subsequent processing step.

10. The process according to any of the claims 1 to 9, wherein the ethylenically unsaturated compound is derived from plant or animal sources; or is an unsaturated fatty acid.

11. The process according to any of the claims 1 to 10, wherein the ethylenically unsaturated compound is derived from palm oil or tallow; or is oleic acid.

12. The process according to any of the claims 1 to 11, wherein the dicarboxylic acid is azelaic acid.

13. A process for producing a monocarboxylic acid and a dicarboxylic acid from an unsaturated carboxylic acid, comprising the steps of:

a) generating an ozone gas in an ozone generator;

b) contacting the ozone gas with an unsaturated carboxylic acid feed comprising the unsaturated carboxylic acid in an absorber to obtain an ozonide; and

c) contacting the ozonide with an oxygen gas and at least one catalyst in a reactor to provide mixed oxidation products, and

d) separating at least a portion of the monocarboxylic acid from the mixed oxidation products by distilling the mixed oxidation products to provide a first distillate and a first residue of the mixed oxidation products, wherein the first distillate comprises a fraction of the monocarboxylic acid, and wherein the first residue of the mixed oxidation products comprises a fraction of the dicarboxylic acid;

e) isolating the monocarboxylic acid from the first distillate; and

f) isolating the dicarboxylic acid by any of the methods of claim 1-12.