CLAIMS:

What is claimed is:

1. A process for upgrading a hydrocarbon, comprising:

determining an amount of acetic acid that will be present in a steam cracker effluent based, at least in part, on a composition of a hydrocarbon feed to be steam cracked, a temperature the hydrocarbon feed will be heated at during steam cracking, a residence time the hydrocarbon feed will be heated at the temperature during steam cracking, or a combination thereof;

providing the hydrocarbon feed;

steam cracking the hydrocarbon feed to produce the steam cracker effluent;

separating a tar product, a steam cracker quench oil, and a first overhead from the steam cracker effluent, wherein the first overhead comprises pygas, acetic acid, and a process gas comprising ethylene;

separating a second overhead comprising the process gas and a first naphtha cut comprising the pygas, water, and acetic acid from the first overhead;

separating a pygas product and a first aqueous mixture comprising acetic acid from the first naphtha cut; and

contacting the first aqueous mixture with a predetermined amount of a neutralizing agent, based at least in part on the determined amount of acetic acid, sufficient to produce a treated mixture comprising neutralized acetic acid.

2. The process of claim 1, wherein the step of providing the hydrocarbon feed comprises: providing a raw feed comprising naphthenic acid(s);

separating the raw feed in a flashing drum to produce an overhead vapor and a heavy bottoms liquid; and

supplying at least a portion of the overhead vapor as at least a portion of the hydrocarbon feed.

3. The process of claim 1 or claim 2, wherein the raw feed has a total acid number ("TAN") ≥ 0.5.

4. The process of claim 2 or claim 3, wherein at least 5 wt% of the totality of the naphthenic acid(s) in the raw feed is distributed into the heavy bottoms liquid.

5. The process of claim 4, wherein up to 20 wt% of the totality of the naphthenic acid(s) in the raw feed is distributed into the heavy bottoms liquid.

6. The process of claim 1, further comprising:

heating the treated mixture to remove hydrogen sulfide, ammonia, or a mixture thereof to produce a third overhead and a second bottoms, wherein the third overhead comprises steam and at least one of hydrogen sulfide and ammonia, and wherein the second bottoms comprises an aqueous mixture comprising neutralized acetic acid;

heating the second bottoms to produce dilution steam;

separating the dilution steam and a third bottoms comprising neutralized acetic acid; and

removing the third bottoms from the process as a process water.

7. The process of claim 6, wherein the third bottoms comprises ≥ 95 wt% of the acetic acid in steam cracker effluent in neutralized form.

8. The process of claim 6 or claim 7, wherein the third bottoms comprises ≥ 99 wt% of the acetic acid in steam cracker effluent in neutralized form.

9. The process of any of claims 1 to 8, wherein the neutralizing agent comprises one or more of: ammonia; a primary amine; a secondary amine; a tertiary amine; a di-amine; and a caustic.