WHAT IS CLAIMED IS:

1. A process of converting syngas into acrylic acid comprising:

a) converting said syngas into methanol and separating the methanol into a first and second stream;

b) carbonylation of the first stream of methanol producing methyl acetate;

c) hydrolyzing the methyl acetate to obtain acetic acid; and

d) reacting by aldol condensation formaldehyde and the acetic acid produced in c) to produce acrylic acid.

2. The process of claim 1, wherein the first stream of methanol is dehydrated to produce dimethyl ether (DME) and the DME is further contacted with syngas under an iodide-free environment to produce the methyl acetate by carbonylation.

3. The process of claim 1, wherein the carbonylation of methanol and hydrolysis of methyl acetate is conducted in a single catalytic vessel producing acetic acid and dimethyl ether (DME).

4. The process of claim 3, wherein the single vessel is a fixed bed reactor.

5. The process of claim 1, wherein the formaldehyde is incorporated following oxidizing of the second stream of the methanol in a gas phase reaction.

6. The process of any one of claims 1-5, wherein the H_2/CO ratio is between 0 and 2.

7. The process of any one of claims 1-6, wherein the methyl acetate is hydrolyzed in a reactive distillation process to produce the acetic acid.

8. The process of claim 7, wherein at least 95% to 99% of carbon based pure acetic acid is produced.

9. The process of any one of claims 1-8, wherein the methanol is oxidized with excess air at 250-400^{o}C, converting up to 99% of methanol into formaldehyde.

10. The process of any one of claims 1-9, wherein the hydrolysis of the methyl acetate is conducted in the presence of methanol to produce the acetic acid.

11. The process of any one of claims 1-10, wherein the carbonylation of the first stream of methanol producing methyl acetate is conducted a gas phase.

12. The process of claim 2, wherein the dehydration of methanol to produce DME is conducted in the presence of a dehydration catalyst.

13. The process of claim 12, wherein the dehydration catalyst is gamma-alumina.

14. The process of claim 2, wherein the DME is further passed into a packed bed reactor in presence of catalyst to produce the methyl acetate.

15. The process of claim 14, wherein the catalyst is a zeolite or a metal modified zeolite.

16. The process of claim 14 or 15, wherein the catalyst comprises a mordenite zeolite, zinc, and copper.

17. The process of claim 2, wherein the unreacted syngas after contacting with DME and producing the methyl acetate is recycled back for conversion of said unreacted syngas into methanol.

18. The process of any one of claims 1-17, wherein the aldol condensation reaction is conducted in a single-pass, fixed-bed, and flow reactor operating under atmospheric pressure on a VPO catalyst.