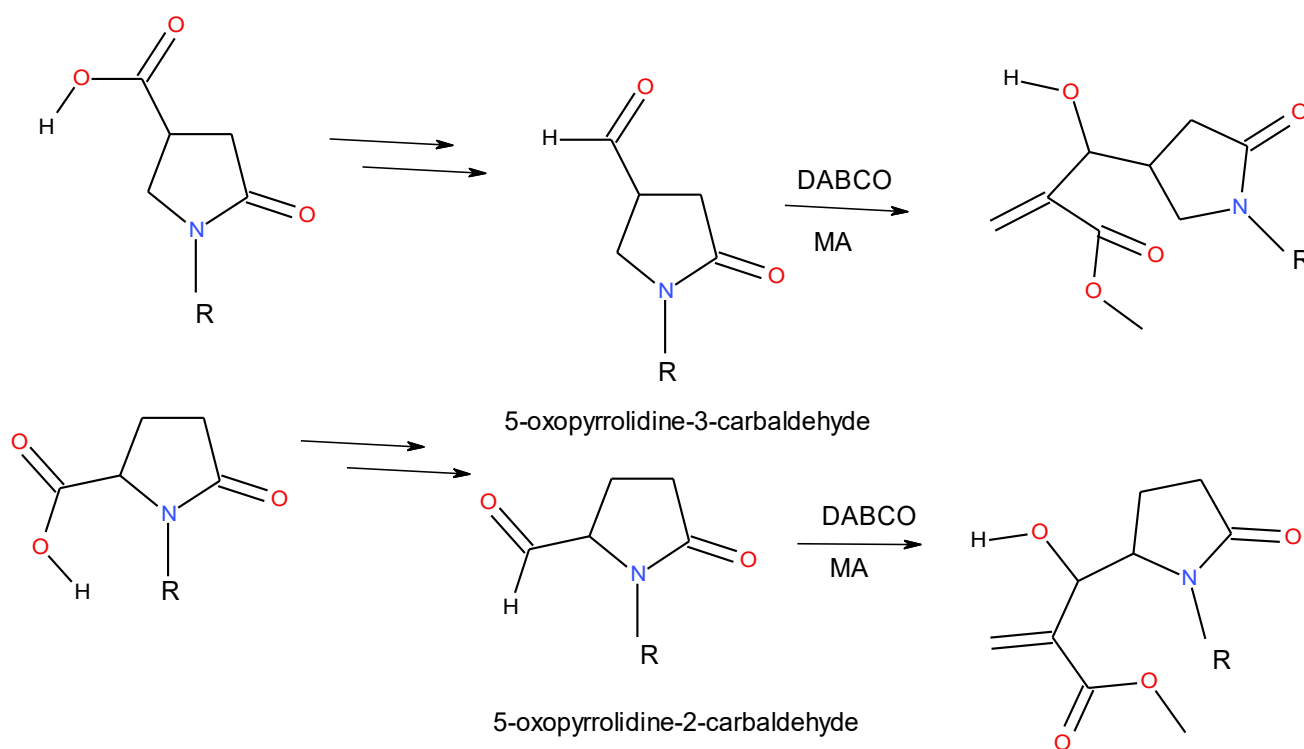


## Pyrrolidone Derivatives of Acrylic Monomers

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This proposal is based on pyrrolidone aldehyde derivatives. For example:



See US 8,334,317 B2, US 2006/0167081 A1 and US 2010/0197939 A1 for examples of the above aldehydes.

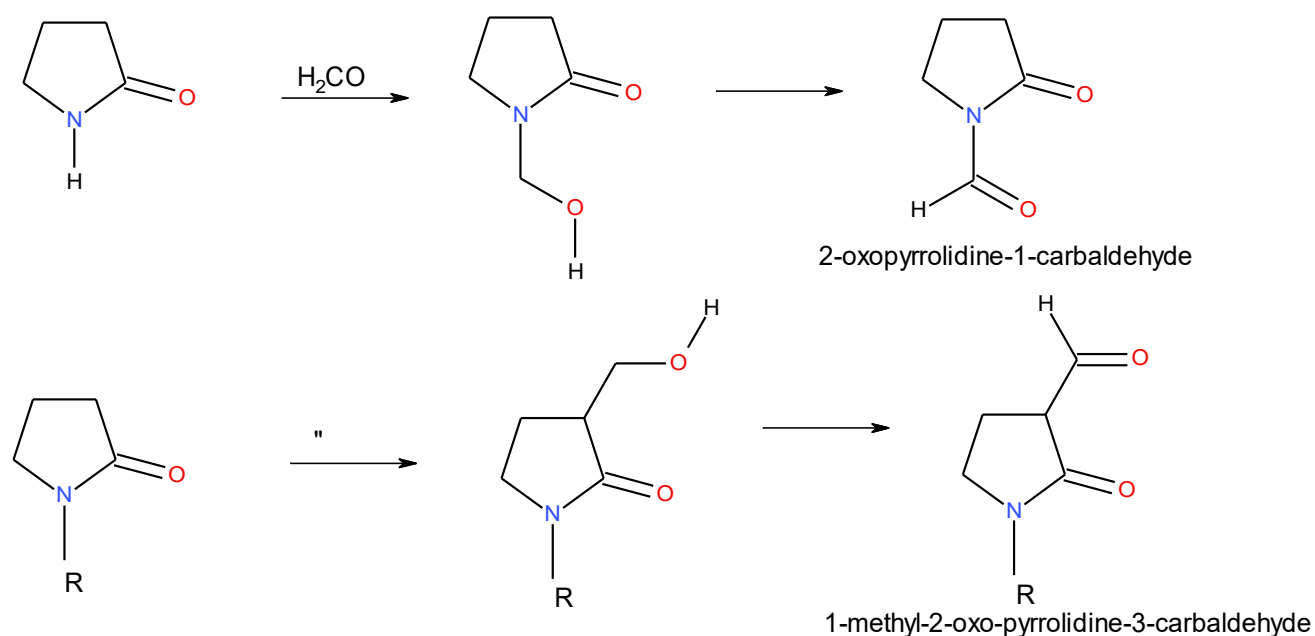
Both examples can be readily prepared by the Morita-Baylis-Hilman reaction.

Obviously other ester or amide acrylates with a variety of R groups could be considered.

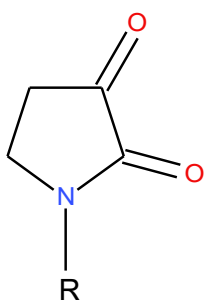
Controlled radical polymerization such as RAFT, MADIX and ATRP etc. would apply readily to these pyrrolidone acrylic monomers affording a wealth of possibilities such as block copolymers, star and brush not to mention dendrimers. The question to ask is would such polymers mimic or improve applications of pvp?

Both of the above monomers originate from natural products that are readily available and would qualify as natural ingredients, but the real reason to consider this chemistry is as always the unexpected properties that might be revealed and their potential value.

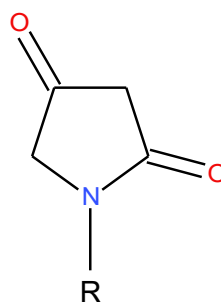
Other aldehyde derivatives can be visualized:



The M-B-H reaction also works with ketones, for example:



1-methylpyrrolidine-2,3-dione



1-methylpyrrolidine-2,4-dione

All of the above possibilities result in polymers that face the lactam away from the polymer backbone. This is the reverse of pvp where the lactam faces the backbone.

The methods to synthesize aldehydes from carboxylic acids are numerous. I found thousands of references on Google Scholar alone. Finding an industrially suitable method, I will leave this to anyone interested in this chemistry.

Some references concerning the synthesis of aldehydes from carboxylic acids:

*Bull. Korean Chem. Soc.* **1999**, Vol. 20, No. 4

*Angew. Chem. Int. Ed.* 2013, 52, 8045 –8049

D.S. Mérel et al. / *Coordination Chemistry Reviews* 288 (2015) 50–68

*CHEM. COMMUN.* , 2002, 836–837

*Bull. Korean Chem. Soc.* **2001**, Vol. 22, No. 3

Thanks for your interest! Please contact me with any questions or information.

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