Polysubstituted and fused **PYRIDINES** are commonly manufactured chemicals which can act as pharmaceutical active ingredients, biological markers, starting ingredients or potential components of novel materials. About 20% of the top 200 drugs on the market have a pyridine compound as an active ingredient or as a starting ingredient in their synthesis.

It is difficult to synthesize high yields of pyridine compounds and conventional substituting methods rarely produce the best types. This leads to an increase in production costs and decreased profit margins, especially for generic drugs where the cost of the active ingredient usually accounts for over 90% of the manufacturing costs.

**A Better Way...**

VCU Researchers have developed a novel and highly efficient mechanism for the manufacturing of pyridine compounds. They have improved the synthesis of halo-substituted nicotinonitriles by incorporating a dehydrating agent, which slows the dimerization of the starting ingredient. This leads to a pronounced improvement in the yield of the final products.

**Applications**
- Synthesis of starting materials
- Synthesis of new pharmaceuticals
- Synthesis of new agrochemicals
- Cost effective commercial-scale manufacturing

**Advantages**
- High yield production
- Easier manufacture with fewer steps
- Reduced production costs
- Adaptable for both batch and flow processes
Efficiency in Action! The Nevirapine Example

As an example, the inventors have successfully used this novel method to streamline the manufacturing process for Nevirapine, a common part of combination drug therapy for HIV. They have reduced the production process from a five step batch process to a single continuous step using flow reactors with a projected production cost reduction of 75%. Yield has increased from 58% to 92%.

Traditional Synthesis Method

Novel Synthesis Method

Single continuous step, 34% yield increase, 75% cost reduction

Find Out More


This technology is available for licensing to industry for further development and commercialization.

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