

DEFENSIVE PUBLICATION

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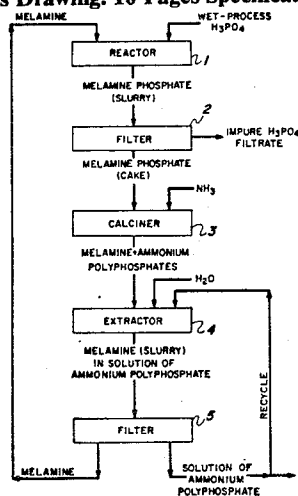
Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

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952 O.G. 8

T952,008
PRODUCTION OF AMMONIUM POLYPHOSPHATES
FROM MELAMINE PHOSPHATES
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U.S. Cl. 423—305

2 Sheets Drawing. 10 Pages Specification



Ammonium polyphosphates are prepared by a process which comprises heating melamine orthophosphate prepared from impure wet-process phosphoric acid in a stream of gaseous ammonia at a temperature between $150^\circ C.$ and $210^\circ C.$ to produce a mixture of melamine and relatively pure short-chain ammonium polyphosphates. The solid product is extracted with water to remove the ammonium polyphosphates and free the insoluble crystalline melamine. The melamine is recycled by treating it with phosphoric acid to make additional melamine orthophosphate. Thus, the only starting materials consumed in the process are phosphoric acid and ammonia.

The distribution of phosphate species in the product may be varied by regulating the time and temperature of heating. A product containing 59 percent ortho-, 38 percent pyro-, and 3 percent more highly condensed phosphates is obtained by heating for 90 minutes at $160^\circ C.$; heating for 40 minutes at $180^\circ C.$ yields a product containing 26 percent ortho-, 60 percent pyro-, 10 percent tri-, 2 percent tetra-, and 2 percent more highly condensed phosphates; and heating for 20 minutes at $200^\circ C.$ yields a product containing 11 percent ortho-, 35 percent pyro-, 17 percent tri-, 14 percent tetra-, and 23 percent more highly condensed phosphates. At temperatures above about $210^\circ C.$, no ammonium polyphosphates are formed and melamine long-chain polyphosphate is the product.

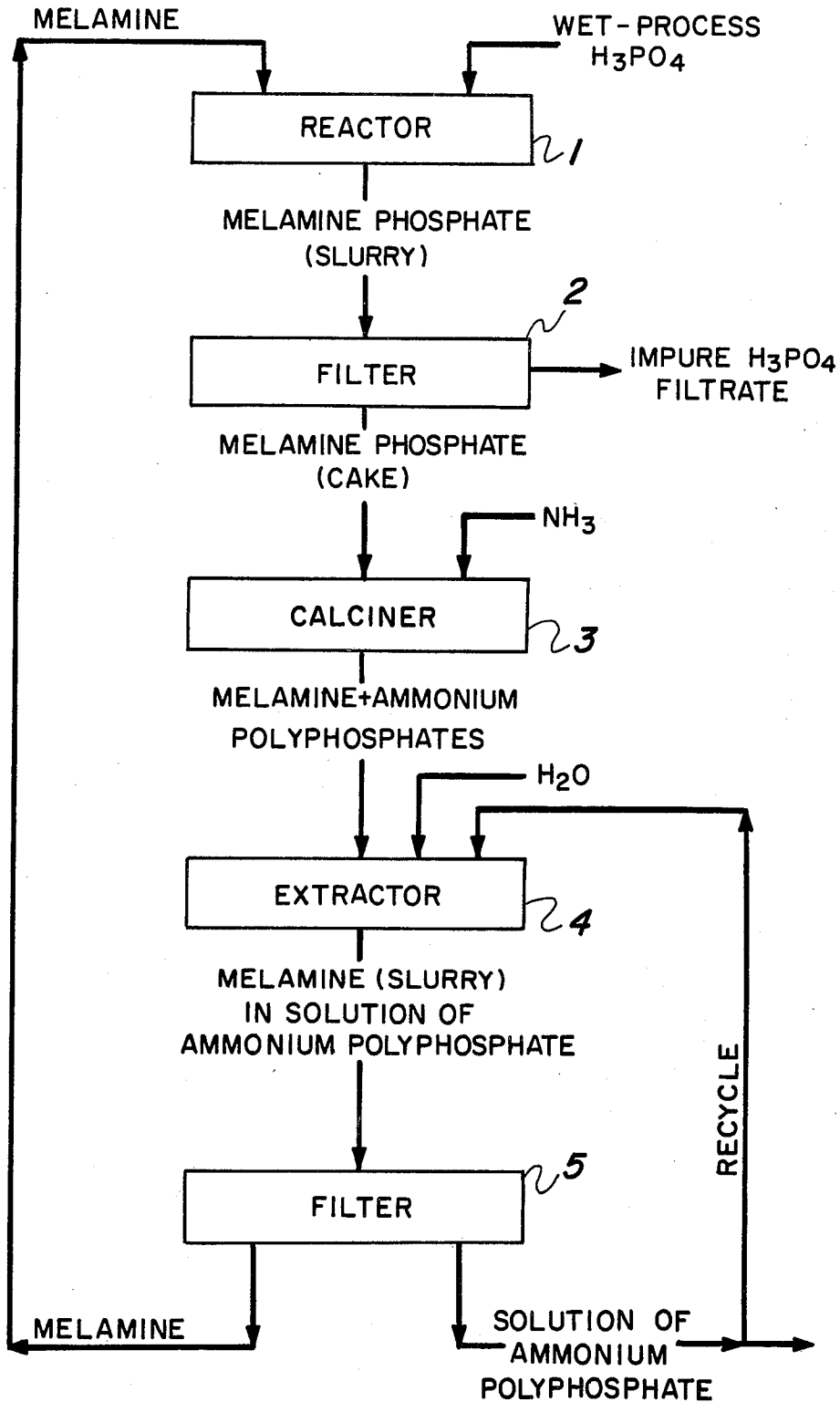
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J. F. McCULLOUGH et al.
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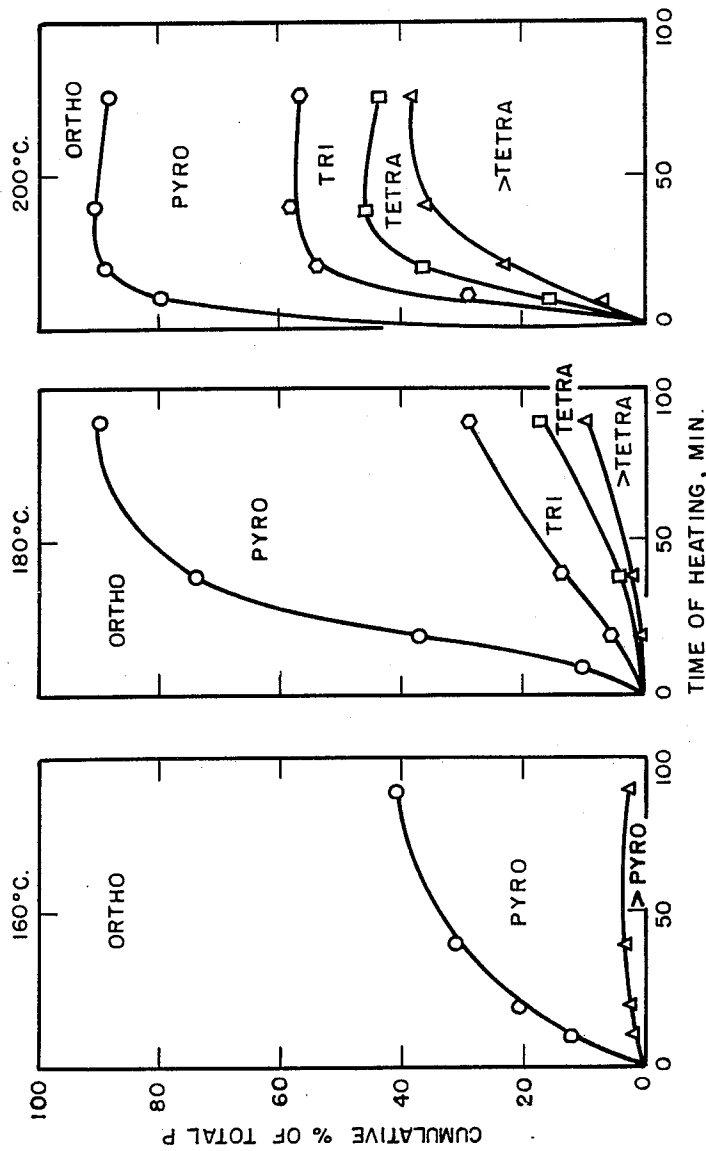
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PREPARATION OF AMMONIUM
POLYPHOSPHATE BY MELAMINE

Fig. 1



EFFECT OF TIME AND TEMPERATURE ON THE CUMULATIVE DISTRIBUTION OF SPECIES IN AMMONIUM PHOSPHATES PREPARED FROM MELAMINE PHOSPHATE (Distance between curves represents the percentage of species)

Fig. 2