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コムギデンプンの『総たん白質含量』試験法に関する研究\*2

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Study on Alternative Catalyst for the Kjeldahl Method to Determine Total Protein  
in Wheat Starch, Aimed at Listing in the Japanese Pharmacopeia

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#### Summary

Wheat starch is a pharmaceutical excipient whose pharmacopeial monograph has been harmonized by the Japanese, United States and European pharmacopeias. In the monograph, total protein in wheat starch is determined by the Kjeldahl method, in which selenium is used as a catalyst for sulphuric acid digestion. Since selenium is toxic, an alternative catalyst would be preferable. In this study, the feasibility of using titanium dioxide as a catalyst was studied. The optimum composition and amount of the catalyst were determined on the basis of the recovery of nitrogen and the time required for digestion of the sample. The use of 4 g of a catalyst mixture containing potassium sulphate, cupric sulphate pentahydrate and titanium dioxide (100 : 3 : 3) and 25 mL of sulphuric acid was satisfactory for digesting 6.0 g of starch sample. Continuous heating for more than 30 min was needed after a clear solution was obtained in order to get a higher recovery of nitrogen. The recovery of nitrogen obtained by the present method was equivalent to that obtained by the method described in the harmonized monograph. Therefore, titanium dioxide can be used as a catalyst instead of selenium in this method.

#### Key words

Kjeldahl method, Wheat starch, Protein, Titanium dioxide, Selenium, Pharmacopeia