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**Preparation of Prolonged-Release Spherical Micro-Matrix of Ibuprofen with Acrylic Polymer by the Emulsion-Solvent Diffusion Method for Improving Bioavailability.**

YOSHIKI KAWASHIMA,\* TOSHIYUKI NIWA, TETSURO HANDA,  
HIROFUMI TAKEUCHI, TARO IWAMOTO, YOJI ITOH

Prolonged-release spherical micro-matrices of ibuprofen with acrylic polymer (Eudragit® RS) were prepared using a novel emulsion-solvent diffusion method. It was found by examining cross sections of the spherical matrix before and after dissolution tests with a scanning electron microscope and a porosimeter that the resultant micro-matrix had a sponge-like internal structure. The spherical matrices were successfully recovered with a relatively high concentration of the drug in ethanol (0.4-0.6g/ml) and over a wide range of temperatures (5-35°C).

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**Introduction of a New Index for the Prediction of Capping Tendency of Tablets.**

KEN-ICHI SUGIMORI, SHOICHI MORI, YOSHIKI KAWASHIMA\*

Capping within a tablet was quantitatively estimated by using the capping ratio, defined as the ratio of the tablet strength to that of the uniformly compacted tablet.

Capping index was also newly defined as the ratio of the extrapolated residual die wall pressure to the binding strength of compacted powder. It was found that capping occurred when the capping index exceeded unity. This fact indicated that capping can be regarded as cracking within a tablet caused by high residual die wall pressure. The requirements to achieve uniform compaction were clarified from these results.

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**The Role of Binders in the Prevention of Capping within a Tablet.**

KEN-ICHI SUGIMORI, SHOICHI MORI, YOSHIKI KAWASHIMA\*

The role of a dry or wet binder in the prevention of capping within a tablet was evaluated by considering the binding strength of compacts and the residual die wall pressure during compression.

Capping of buccetin tablets was not prevented by adding dried colloidal silica, which increased the binding strength and the residual pressure. However, the addition of dried low-substituted hydroxypropyl cellulose, which increased the binding strength but decreased the residual pressure, prevented the capping.

The effect of addition methods of a low viscosity grade of hydroxypropyl cellulose and  $\alpha$ -starch was also investigated for buccetin and ascorbic acid tablets.