SS02-5 **Measurement of a small amount of crystal polymorphism in a tablet by the synchrotron powder X-ray diffractometry**

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Generally, it is very difficult to detect a small amount of crystal polymorphism changes in a tablet due to the large amount of excipients. However, resulting from changes in solid state, it may give adverse effects on quality in drug production (e.g. dissolution behavior, hardness.). Here, if the content of the crystal polymorphism difference in tablets can be measured directly, it is expected to lead to more certain quality control of process step. Using the synchrotron powder X-ray diffractometry, we can carry out for high sensitivity measurement with the parallel and bright X-ray beams. In addition, since a wavelength for data collection can also be chosen arbitrarily, measurement condition can be optimized to thickness of the tablet. We have determined the optimal conditions such as wavelength, transmission distance, and tablet rotation method, for aiming to measure the content of a small amount of crystal polymorphisms without destroying a tablet. Using this condition, the changes of crystal polymorphism in tablets was observed. As a result, a pseudo-transition under humidification conditions for the thiamine hydrochloride tablets was observed as it is. In this measurement, the detection limit was estimated at approximately 0.02%. Moreover, activation energy in this transition was estimated. In another tablets, a transition of crystal forms from form-A to form-B was observed by blowing the warm air as it is also. However, since an actual temperature of the tablet was unknown due to hardware limitation, detail kinetics analysis was not achieved. It is expected that improvements of hardware for the future allow for accurate experiment.