

## Chapter VI

### Summary

The objective of the present thesis was the development of a suited route to process rice husk into a high grade silica product. This required the development of different techniques for material processing and characterization. Among other tasks, a commercial apparatus for specific surface area determination was built up and calibrated, and a procedure for accurate and precise measurement was developed.

In general, the results acquired during this thesis were just a start in research on silica from rice husk in Thailand. Nevertheless, the general state of knowledge and know-how as laid down in literature was reached. Significant progress could be made beyond this state, especially in understanding the structure of the starting material and the product, and in producing a highly pure, uniform, colloidal, high specific surface area product. This was achieved by a sequence of washing, enzymatic digestion, acid leaching, and packed bed incineration. The product had properties intermediate to those of a commercial precipitated and fumed silica. Densely packed primary particles of 2-3 nm size and loosely coordinated secondary particles of 20-30 nm size determined the specific surface area (BET, N<sub>2</sub>) which typically reached 200 to 250 m<sup>2</sup>/g. Higher agglomerates ranged from 0.3 to 30 μm. A purity of > 99.4 wt.% silica was generally reached.

It is hoped that the results of this thesis encourage the use of a valuable local resource, by this also reducing the need for imported silica.