



## KNOWLEDGE-BASED MODELING FOR PREDICTING CANE SUGAR CRYSTALLIZATION STATE

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*Abstract- This paper proposes a knowledge-based model applied to an experimental scale evaporative cane sugar crystallization process, which combines the methods of offline and online knowledge acquisition. Firstly, a data mining method based on rough set theory is utilized to extract information from the large quantity of relevant data obtained in experiment. This method products an offline predictive knowledge. Thereafter, a method for online knowledge learning and self-improvement is put forward, based on support vector machine with particle swarm optimization, to improve the predictive accuracy and generalization capacity. Furthermore, the intelligent system is tested using a self-regulating intelligent comprehensive monitoring and controlling platform that represents the cane sugar process. Results demonstrate the feasibility of the system for predicting the crystallization state in a real cane sugar process.*

**Index terms:** Cane sugar crystallization state, intelligent system, knowledge acquisition, rough set, support vector machine