The objective of this project was to evaluate the possibility of granulation during start-up of UASB wastewater treatment system. Five-liter UASB systems and two hundred-liter UASB systems were used and operated under room temperature. The investigated parameters were 1) three types of seeded sludge (anaerobic-pond sludge, anaerobic-digester sludge, and activated sludge), 2) four types of wastewater (synthetic carbohydrate-rich wastewater, synthetic protein-rich wastewater, carbohydrate-rich wastewater, and protein-rich wastewater), and 3) two average liquid upflow velocities (0.25 and 0.5 meter per hour). There were totally 28 UASB reactors investigated. To perform the experimental evaluation, wastewaters, effluent and sludge of each UASB system were analyzed. The results showed that granulation were found in all tested UASB systems. Granules could be observed after 30 days of experiment. The characteristics of granules mainly depended on the type of wastewater. Both average liquid upflow velocities (0.25 and 0.5 meter per hour) were good for granulation process. Activated sludge, which is aerobic sludge, could be used as seed sludge for UASB systems as well we anaerobic-pond sludge and anaerobic-digester sludge. This research project suggested that granulation process and application of UASB system for industrial scale could be done without any need of technology import.