Revolutionary Cooking Exhaust Removal System for Commercial Kitchens

Cheng, Ka Shuen Connie
Hui, Tsz Chung Kenneth
Tang, Man Chung

Commercial kitchens often involve deep fry or stir fry cooking, especially in many of fast food restaurants around the world. The resulting exhaust fumes and odors produced from kitchens are not just an environmental nuisance but also a serious health problem which can be carcinogenic. In order to tackle these problems, many restaurants use various types of system to remove or reduce the hazardous exhaust before they are discharged into the atmosphere. However the effectiveness of these systems come into question and can be expensive to operate, wasteful and not Eco-friendly. In this project a revolutionary cooking exhaust removal system has been developed for commercial kitchens using MCM-41 which can only absorb the cooking fume and VOC, it won't absorb the steam. It's surface composition can specially modify to enhance the selective and regenerative adsorption of organic vapors (VOC). After modification, MCM-41 has a good regenerability and it still keeps a large adsorption capacity. It is cost-effectiveness and safe to use in kitchen environment. The system uses a combination of volatile organic compound-selective absorption/desorption and high temperature thermal destruction to remove the odor and the remaining fume. Measurements were carried out from the exhaust removal system during deep fry cooking and was found that 70-80% of oil mist can be effectively removed and odors given out were kept to a minimal. The system will hopefully be simplified and reduced in size so that it can be installed in most domestic kitchens.

Awards Won: