Wet chemical synthesis of nanoparticles is playing a decisive role in controlling size, the shape, and crystallinity of nanoparticles by tuning reaction parameters. Adopting batch format to a flow synthesis have shown an increase in the production rate of nanoparticles by maintaining product quality. Manufacturing nanoparticles at large quantity by flow synthesis can meet current industrial requirement and nanoparticles would be available in the market at affordable prices. In this talk, I would like to explain about developing a new wet chemical approach for rapid synthesis of phase pure CuO, Cu$_2$O, and NiPt alloy nanoparticles by using microwave-assisted flow synthesis. We have extended batch parameter for flow synthesis of nanoparticles to produce nanoparticles at higher production rate compared to current state of the art. Copper oxide and NiPt alloy nanoparticles exhibit better activity for gas sensing and electro-chemical hydrogen evolution reaction.