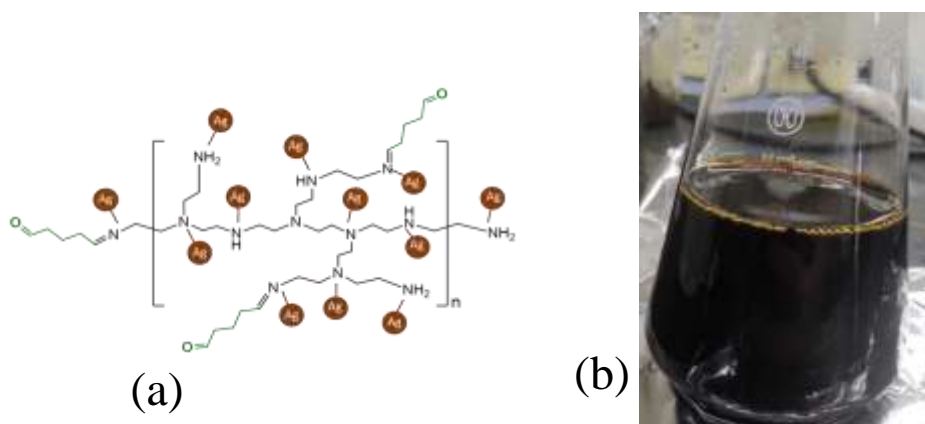
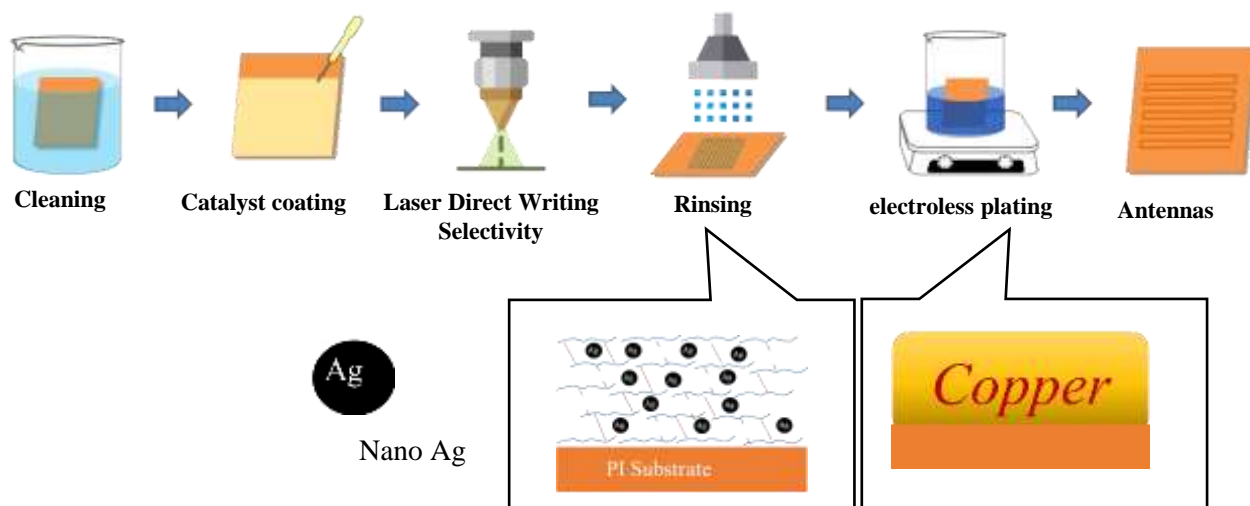


# Supplemental Document



**Fig. 1 catalyst : PEI-GA-Ag (a) structure and (b) sample**



**Fig. 2. Scheme for manufacturing copper Antennas patterns on PI surface**