In the search of fluorescent nanoclusters for bioimaging, several synthetic methods have been attempted. Particularly, the formation of gold nanoclusters during synthesis of gold nanoparticles (AuNPs) using Good’s buffers has been achieved. Here 2-(N-morpholino) ethanesulfonic acid (MES), 3-(N-morpholino) propanesulfonic acid (MOPS) and 4-(N-morpholino) butanesulfonic acid (MOBS) are chosen Good’s buffers. Resultant AuNP solutions have been subjected to electrochemical investigations along with UV-vis and fluorescent spectroscopies. Distinct absorption features at ca. 290 and 360 nm and fluorescence emission in range of 350-485 nm are observed in filtrated AuNP-free solutions. Notably, electrochemical oxidation of the buffers generates similar optical properties, suggesting that the degradation products of these compounds contribute significantly to the optical properties in AuNP solutions. This work indicates a need for deeper evaluation of fluorescence signals based on metal nanoparticles or nanoclusters.