Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

SUPPORTING INFORMATION

Mechanism of organic radicals' oxidation catalyzed by gold nanoparticles

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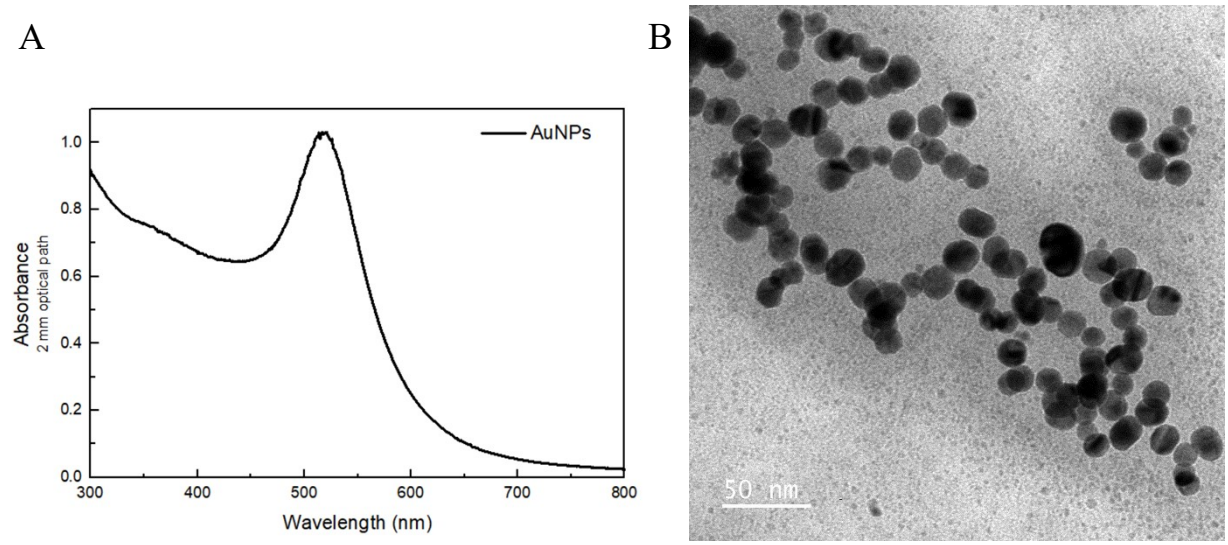

Figure S1. A - UV-vis absorption spetrum of AuNPs suspension containing 3 mM of gold atoms. The suspension was diluted two times with deionized water. B – TEM image of AuNPs.

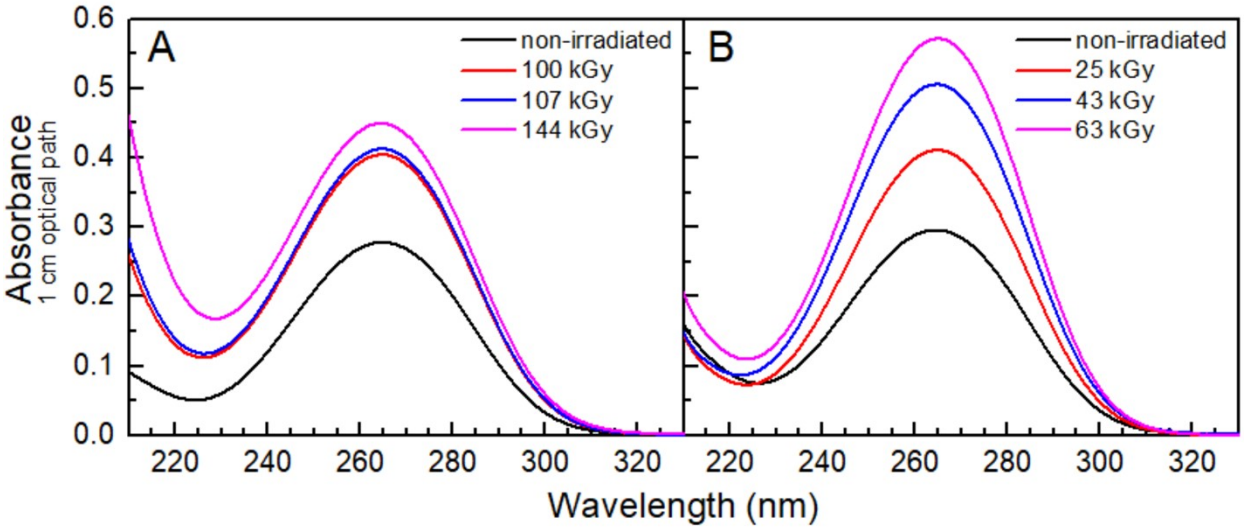

Figure S2. Evolution of UV-vis absorption spectra after different dose deposition of samples containing 100 mM of 2-propanol and 20 mM of acetone in the supernatant (A) and AuNPs suspension containing 3 mM of gold atoms (B). All samples were deoxygated with Ar.

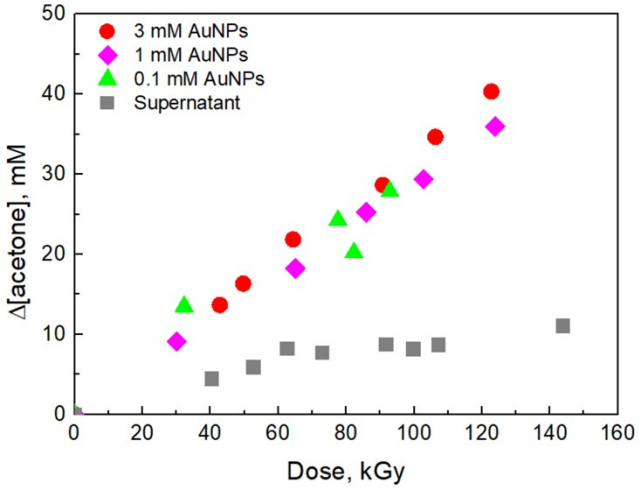

Figure S3. Acetone formation in AuNPs' suspension at different concentration. All solutions contain 100 mM of 2-propanol, 20 mM of acetone and deoxygenated by Ar gas.

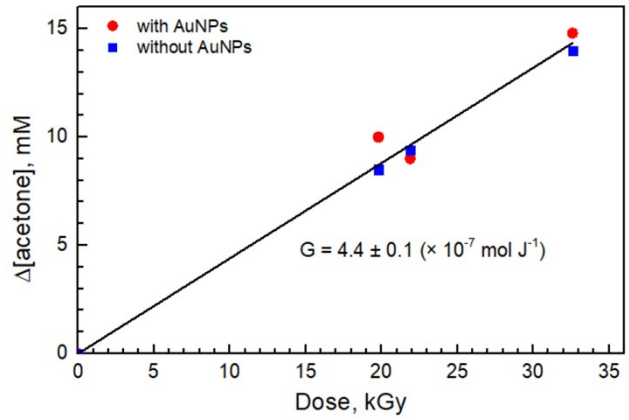

Figure S4. Acetone formation under irradiation by electron accelerator ELYSE (dose rate ~10^{13} Gy s^{-1}). Irradiated solutions contained 100 mM of 2-propanol and were continuously bubbled with N_2O.

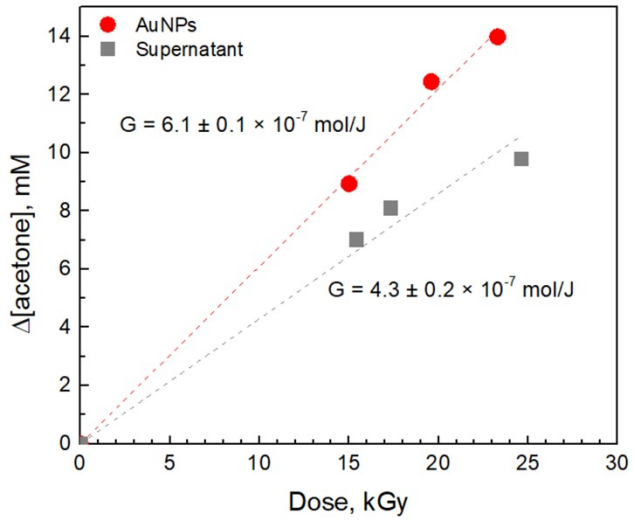

Figure S5. Acetone formation in the AuNPs' suspension (3 mM) and the supernatant containing 100 mM of 2-propanol, deoxygenated with N_2O and irradiated by gamma rays at various doses.

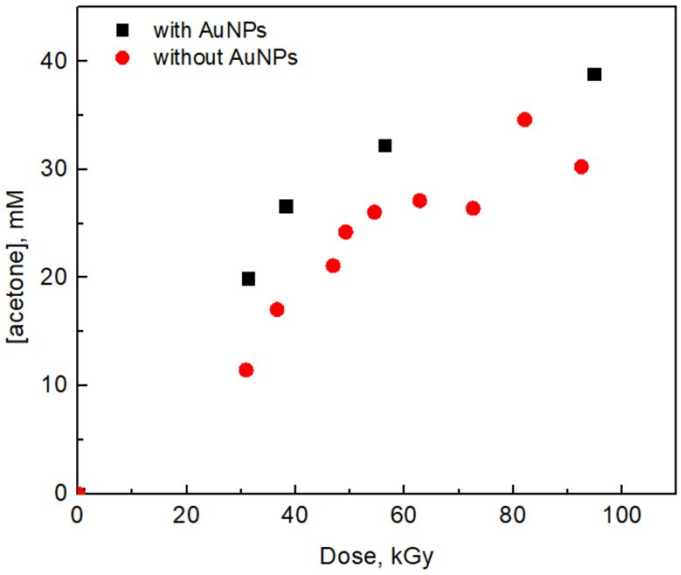

Figure S6. Acetone formation in AuNPs' suspension (red dots) and its supernatant (black squares) under gamma radiation. Both solutions were oxygen saturated and contained 100 mM of 2-propanol and 20 mM of acetone.

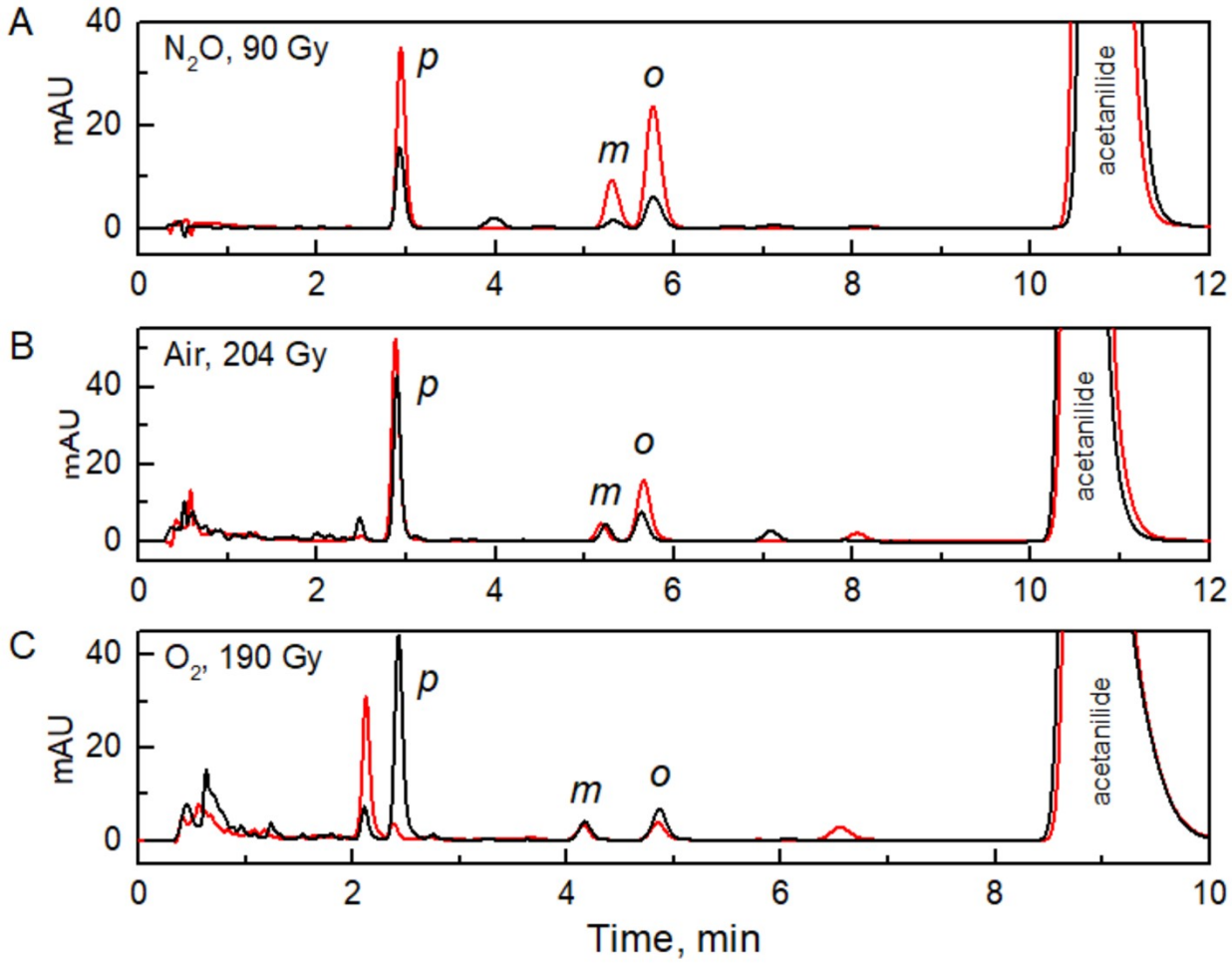

Figure S7. HPLC profiles samples irradiated by gamma rays (^{60}Co) under different atmospheres. Black lines represent 0.5 mM acetanilide aqueous solution; red lines represent 0.5 mM of acetanilide in 1.5 mM AuNPs suspension. A – samples irradiated under N_2O at 90 Gy, B - samples irradiated under air at 204 Gy, and C - samples irradiated under O_2 at 190 Gy. *p, m, and o is* para-, meta-, and ortho-acetamidophenol respectively.

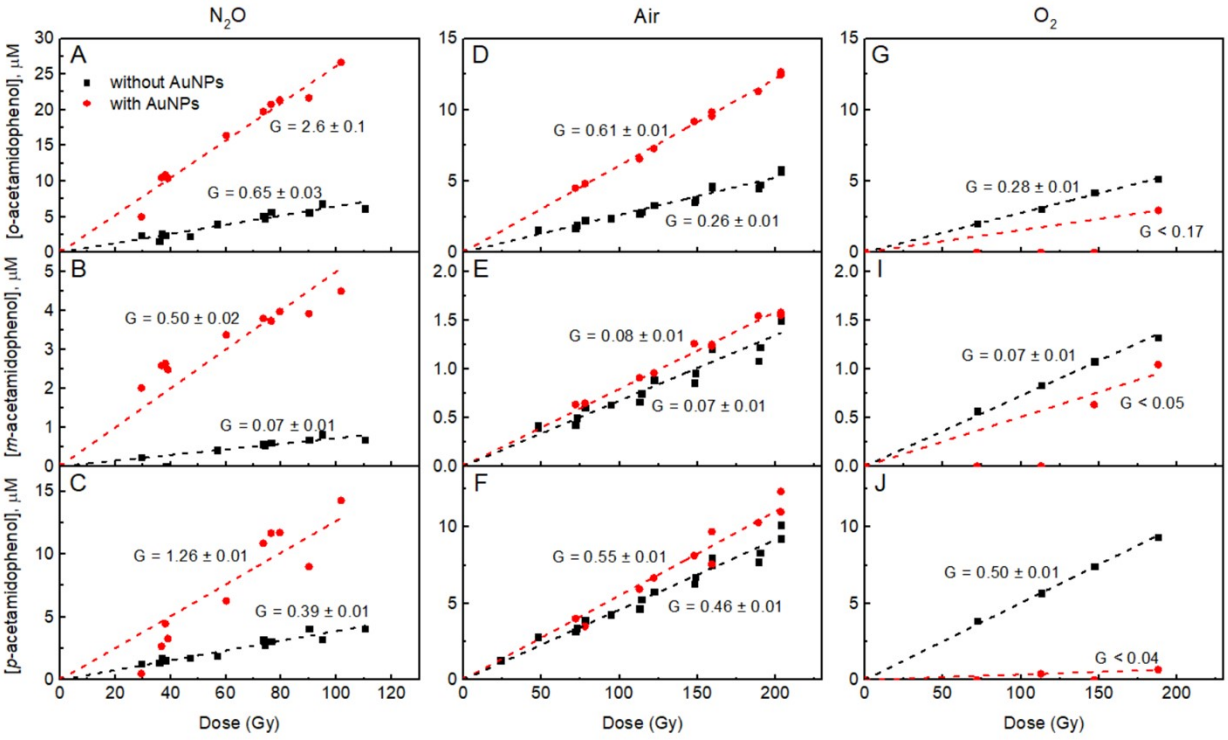

Figure S8. Formation of o-, m-, and p-acetamidophenol in water radiolysis (^{60}Co) of 0.5 mM acetanilide aqueous solution (black squares) and in the presence of 1.5 mM of AuNPs (red dots) under three different atmospheres. G is a radiolytic yield ($\times 10^{-7}$ mol J^{-1}).