***Supporting Information***

**Removal of multiple pollutants from water using a noble metal/magnetite/graphene/H2O2 system under light and ultrasound irradiation**

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**Supplementary Files**

**Fig. S1**. Blank test experiment, without samples

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| **Fig. S2.** Leaching of Fe2+ ion of Ag/Au/F-10G at different acid. |

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| **Fig. S3.** Leaching of Total Fe ion of Ag/Au/F-10G at different acid. |

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| **Fig. S4.** Leaching of Ag ion of Ag/Au/F-10G at different acid. |

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| **Fig. S5.** Change of the pH value during MB degradation in the presence of acids solution. |

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| **Fig. S6.** Leaching of Ag in the Ag/Au/F-10G at anion. |

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| **Fig. S7.** Influence of anion concentration on the removal ability of MB.**Table S1.** Au, Ag, and Fe concentration taken by XPS analysis.

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| **Sample** | **Atomic %** | **Fe:Ag:Au** |
| **Ag** | **Au** | **Fe** |
| Ag/F-10G | 2.13 | - | 12.38 | 1:0.17:0 |
| Au/F-10G | - | 1.62 | 7.09 | 1:0:0.22 |
| Ag/Au/F-10G | 0.62 | 0.83 | 9.85 | 1:0.08:0.06 |

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