

## Preparation of gold nanoparticle using reactive species produced in room-temperature ionic liquid by accelerated electron beam irradiation

Tetsuya Tsuda,<sup>\*ab</sup> Taiki Sakamoto,<sup>b</sup> Yoshitomo Nishimura,<sup>b</sup> Satoshi Seino,<sup>a</sup> Akihito Imanishi,<sup>cd</sup> Kazuhiko Matsumoto,<sup>e</sup> Rika Hagiwara,<sup>e</sup> Taro Uematsu<sup>b</sup> and Susumu Kuwabata<sup>\*bd</sup>

<sup>a</sup> Frontier Research Base for Global Young Researchers, Graduate School of Engineering, Osaka University, 2-1 Yamada-oka, Suita, Osaka 565-0871, Japan. Fax&Tel: +81-6-6879-7374; E-mail: [ttsuda@chem.eng.osaka-u.ac.jp](mailto:ttsuda@chem.eng.osaka-u.ac.jp)

<sup>b</sup> Department of Applied Chemistry, Graduate School of Engineering, Osaka University, 2-1 Yamada-oka, Suita, Osaka 565-0871, Japan. E-mail: [kuwabata@chem.eng.osaka-u.ac.jp](mailto:kuwabata@chem.eng.osaka-u.ac.jp)

<sup>c</sup> Department of Chemistry, Graduate School of Engineering Science, Osaka University, 1-3 Machikaneyama, Toyonaka, Osaka 560-8531, Japan

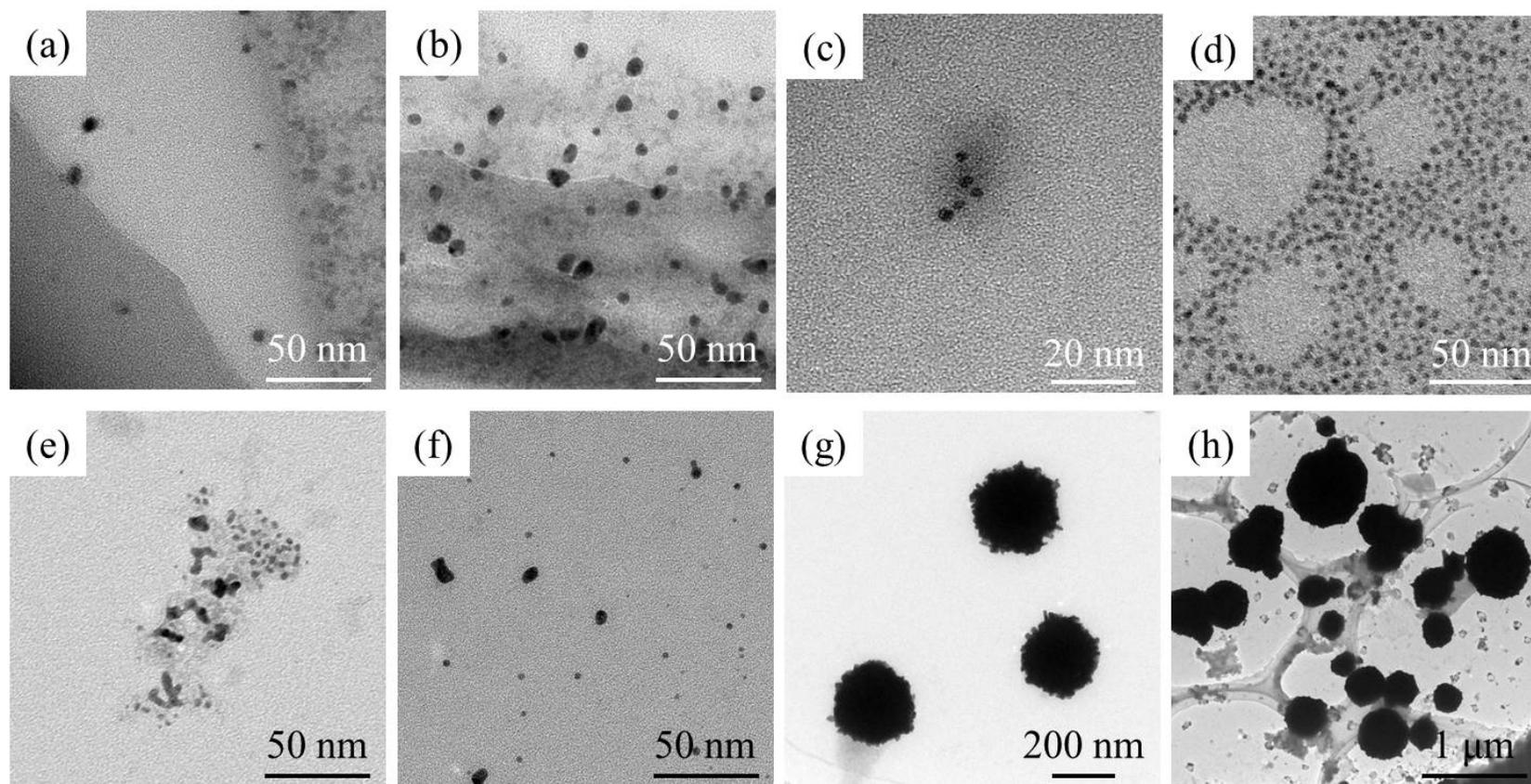
<sup>d</sup> Core Research for Evolutional Science and Technology (CREST), Japan Science and Technology Agency (JST), Kawaguchi, Saitama 332-0012, Japan

<sup>e</sup> Department of Fundamental Energy Science, Graduate School of Energy Science, Kyoto University, Sakyo-ku, Kyoto 606-8501, Japan

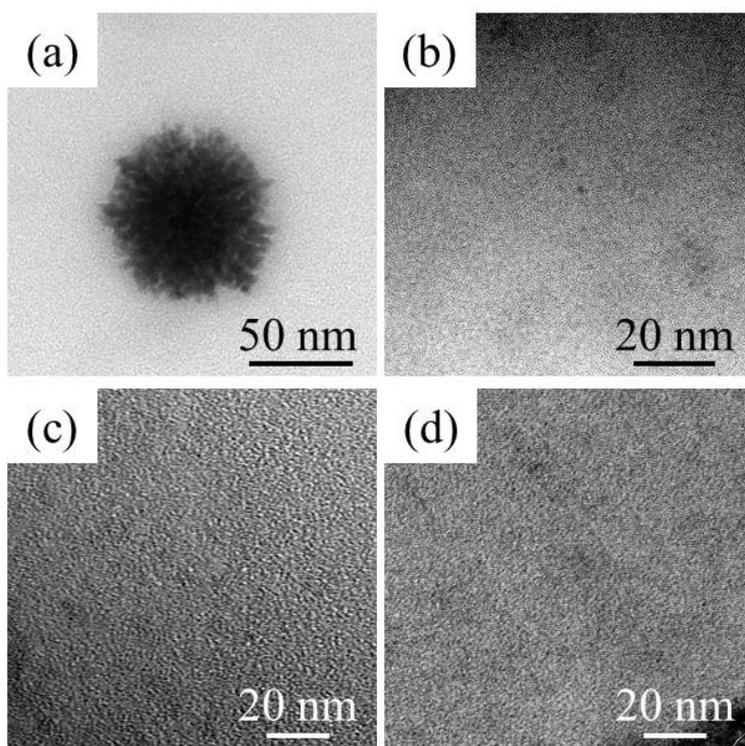
### Table of Contents

Fig. S1-S2

2



**Fig. S1** TEM images of Au nanoparticles prepared by accelerated electron beam irradiation in [BuMeIm][Tf<sub>2</sub>N] with different NaAuCl<sub>4</sub>·2H<sub>2</sub>O concentrations. The irradiation dose was 20 kGy. The concentrations were (a) 0.10, (b) 0.25, (c) 0.50, (d) 1.0, (e) 2.5, (f) 5.0, (g) 10 and (h) 20 mmol L<sup>-1</sup>.



**Fig. S2** TEM images of Au nanoparticles prepared by accelerated electron beam irradiation in  $[R_1\text{MeIm}][\text{Tf}_2\text{N}]$  RTILs containing  $1.0 \text{ mmol L}^{-1}$   $\text{NaAuCl}_4 \cdot 2\text{H}_2\text{O}$ . The irradiation dose was 6 kGy. The RTILs were (a)  $[\text{EtMeIm}][\text{Tf}_2\text{N}]$ , (b)  $[\text{HexMeIm}][\text{Tf}_2\text{N}]$ , (c)  $[\text{MeOctIm}][\text{Tf}_2\text{N}]$  and (d)  $[\text{DecMeIm}][\text{Tf}_2\text{N}]$ .