Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Respective liquid chromatograms:

1. Effect of Au-Pd Ratio Based on Different Support

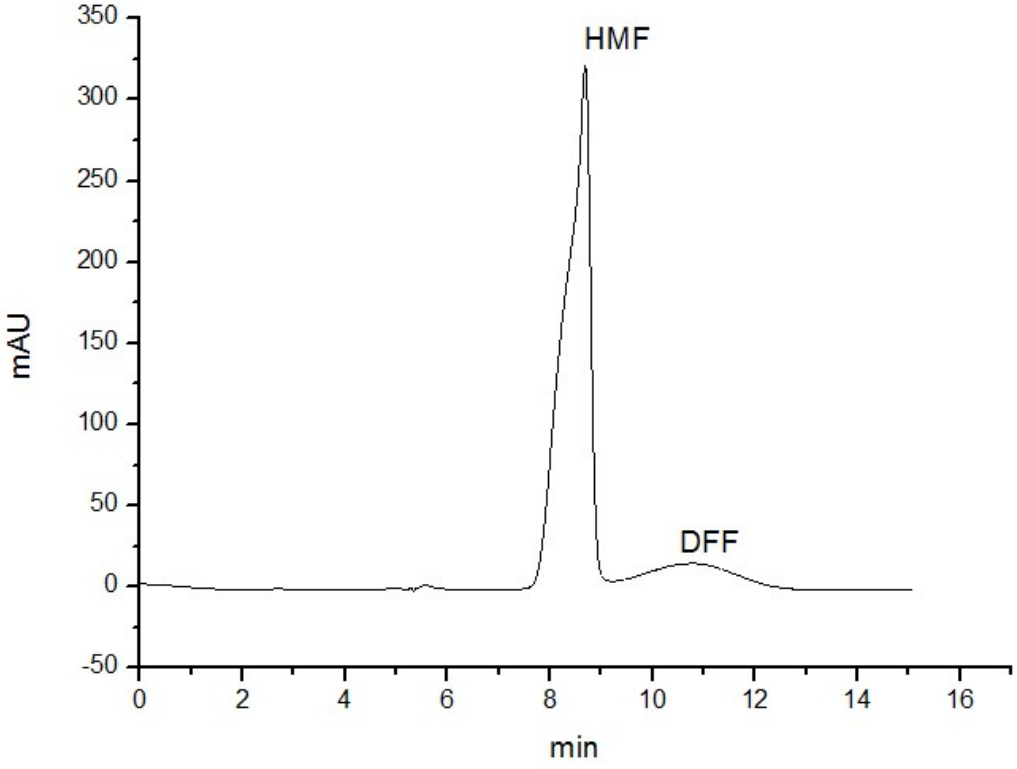

Figure 1. Bare Au supported on microsphere MnO_2. Conversion: 11%, selectivity: 95%.

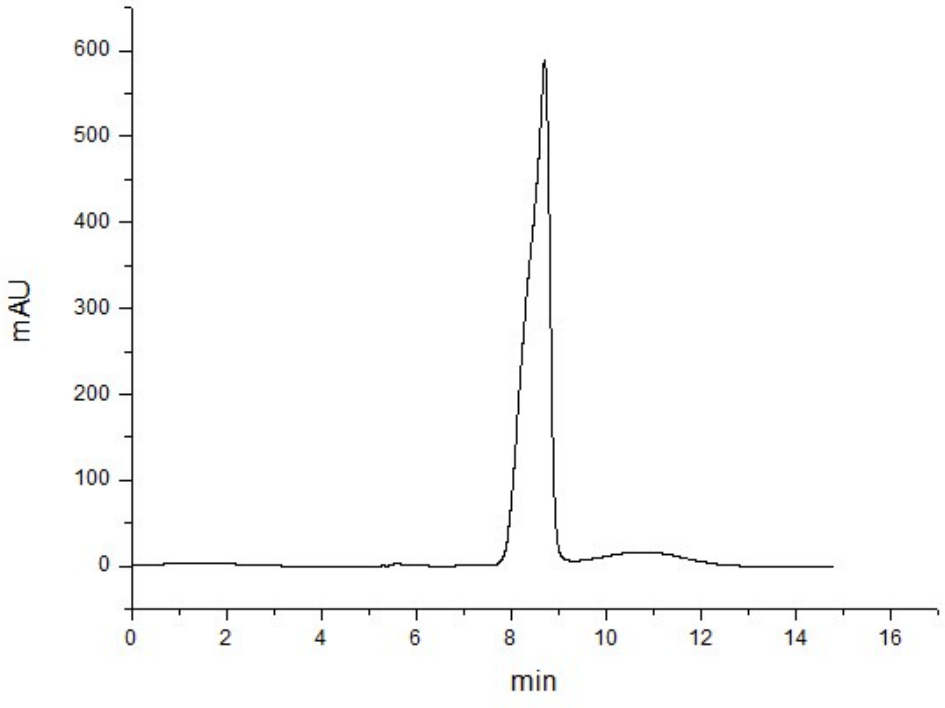

Figure 2. Bare Au supported on cubic MnO_2. Conversion: 6%, selectivity: 95%.

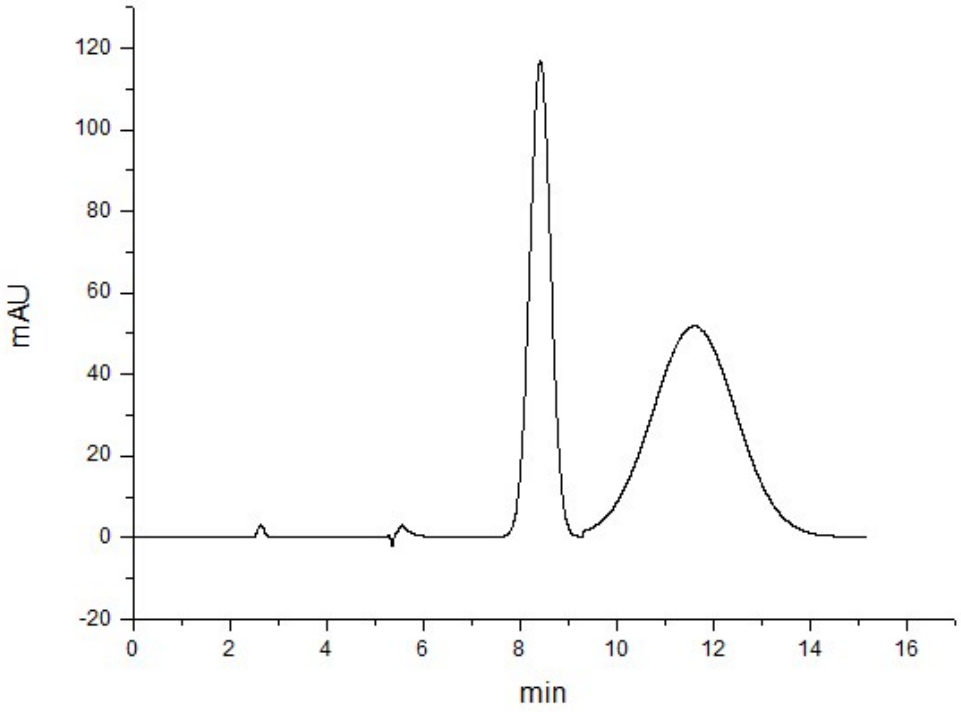

Figure 3. Au: Pd = 7:1, supported on microsphere MnO_2. Conversion: 63%, selectivity: 97%.

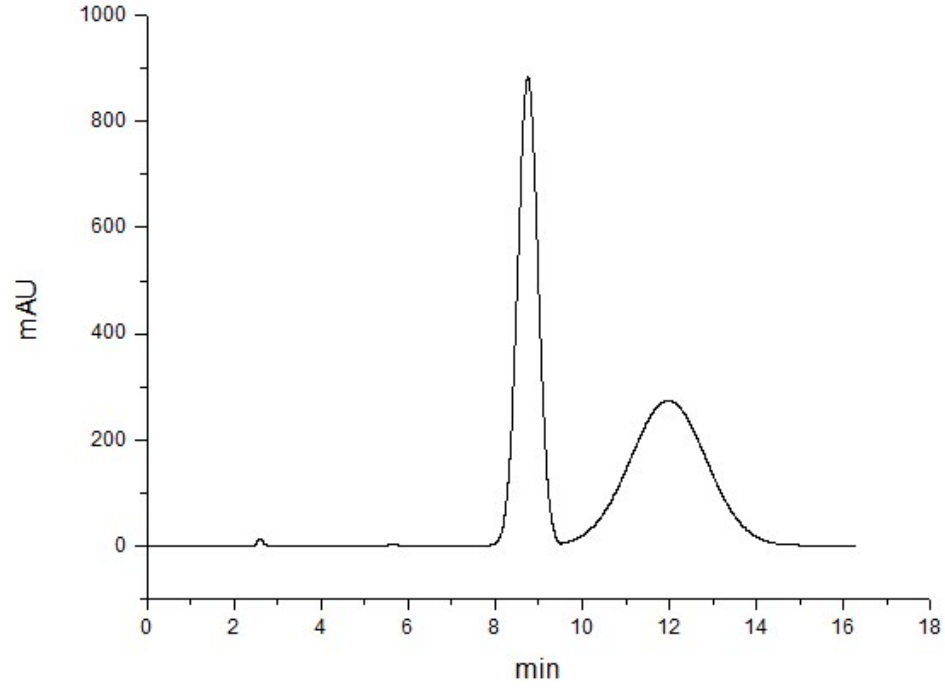

Figure 4. Au: Pd = 7:1, supported on cubic MnO_2. Conversion: 53%, selectivity: 97%.

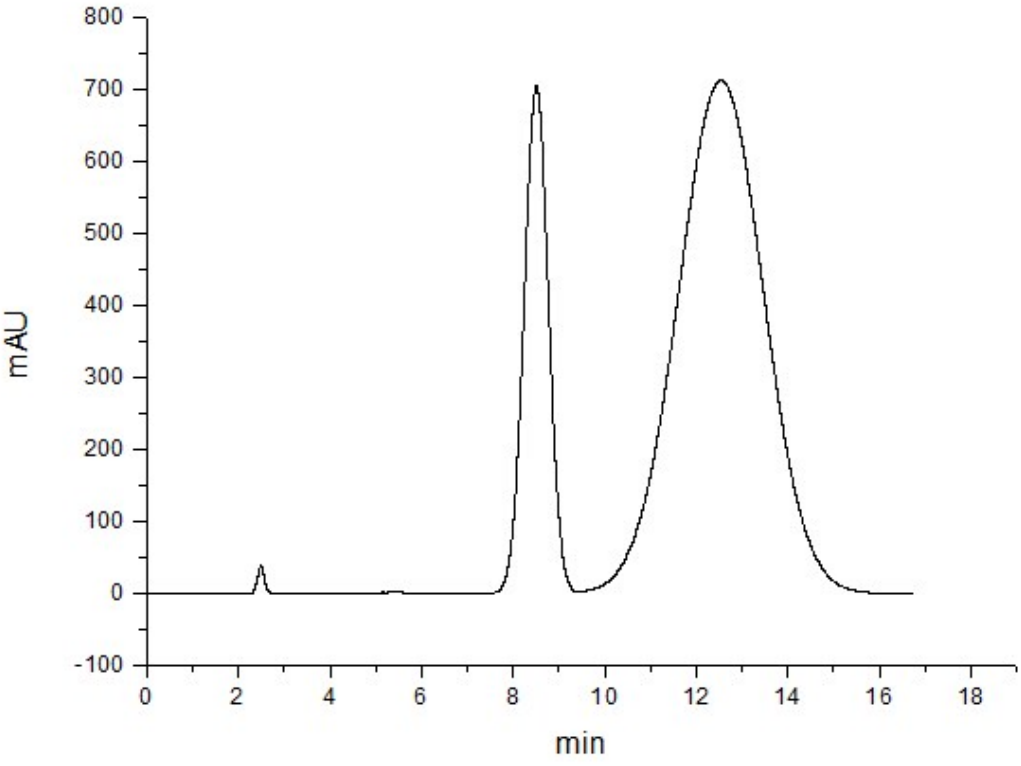

Figure 5. Au: Pd = 2:1, supported on microsphere MnO_2. Conversion: 76%, selectivity: 98%.

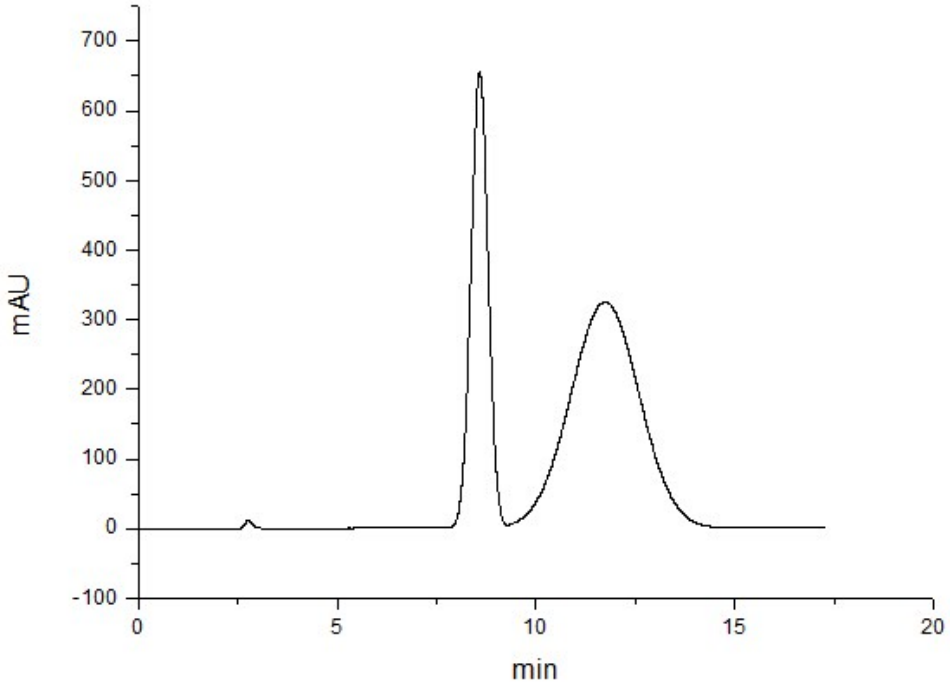

Figure 6. Au: Pd = 2:1, supported on cubic MnO_2. Conversion: 65%, selectivity: 98%.

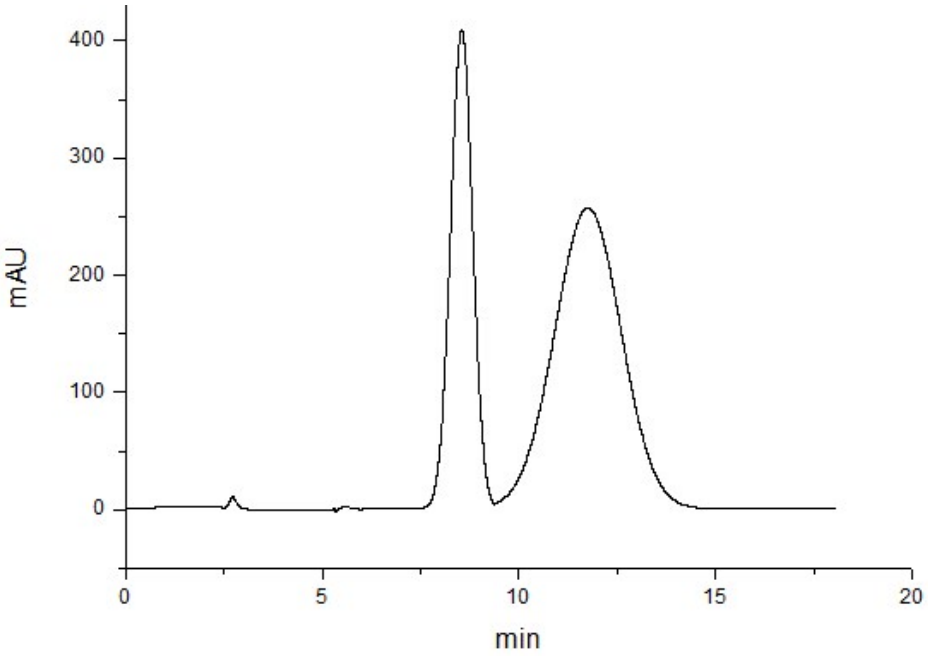

Figure 7. Au: Pd = 1:1, supported on microsphere MnO_2. Conversion: 65%, selectivity: 97%.

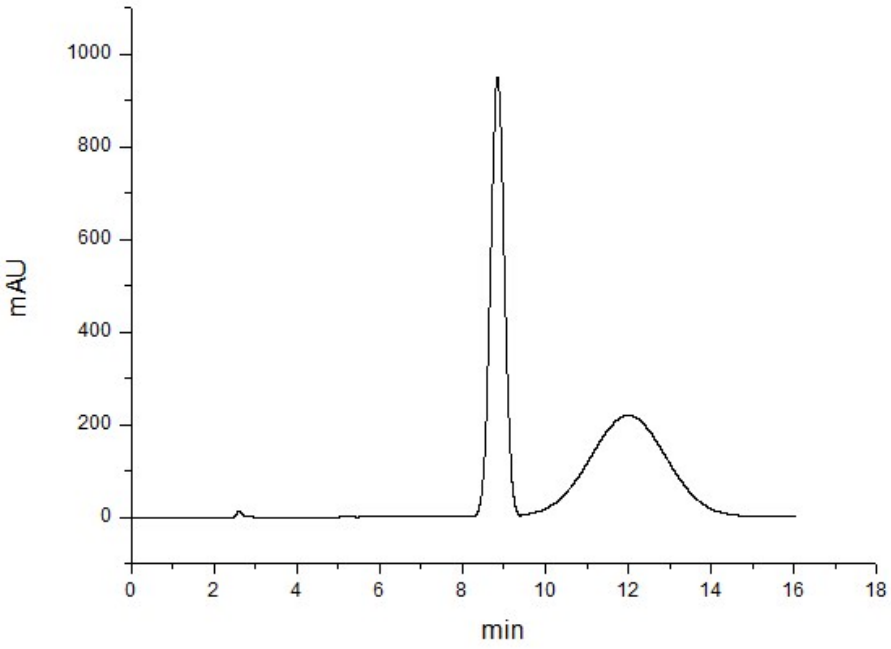

Figure 8. Au: Pd = 1:1, supported on cubic MnO_2. Conversion: 54%, selectivity: 98%.

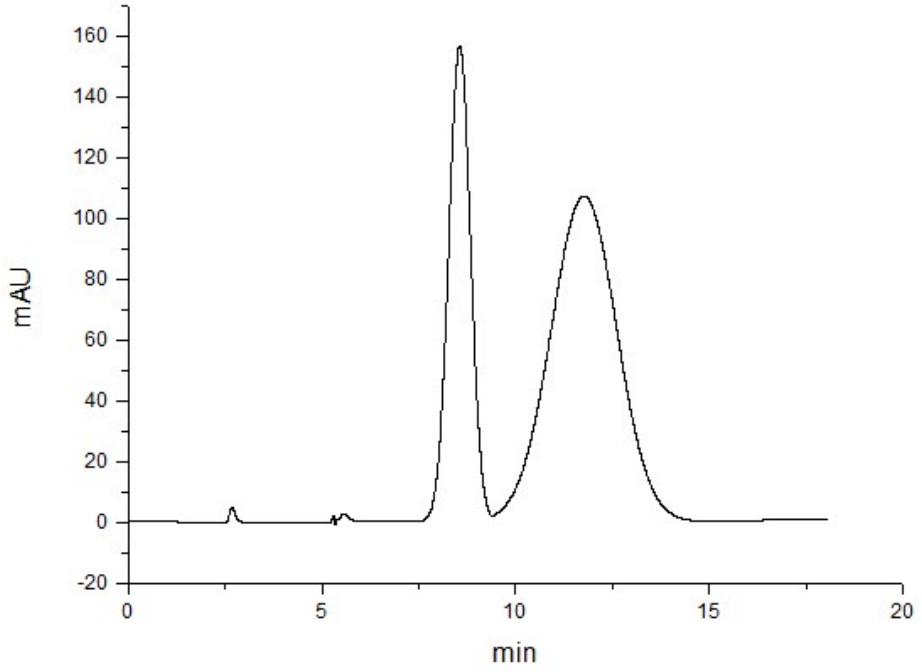

Figure 9. Au: Pd = 1:2, supported on microsphere MnO_2. Conversion: 67%, selectivity: 98%.

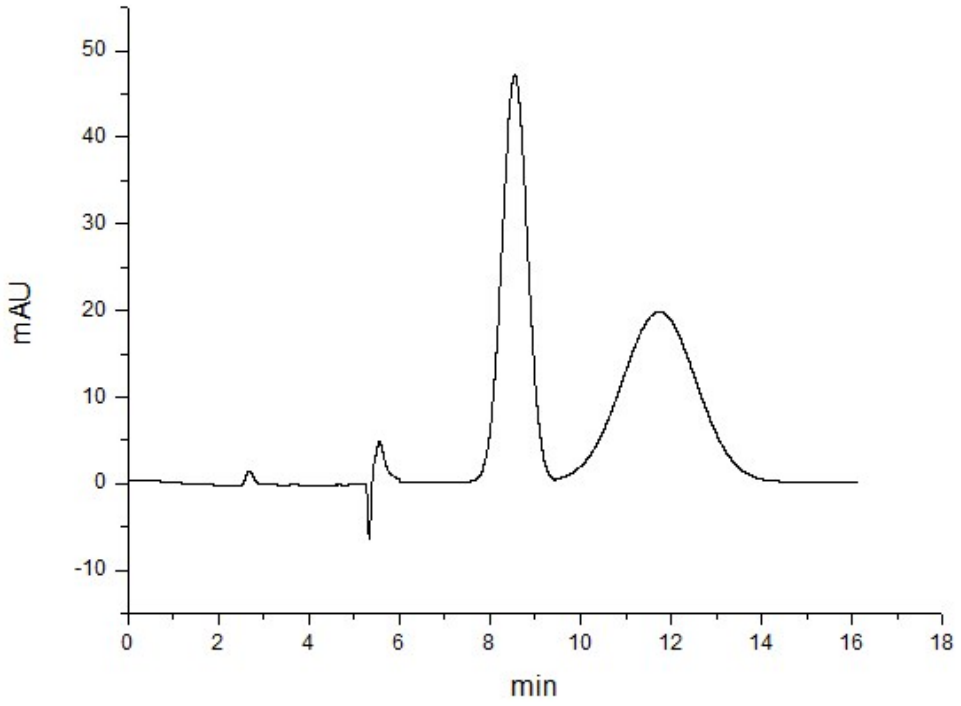

Figure 10. Au: Pd = 1:2, supported on cubic MnO_2. Conversion: 64%, selectivity: 97%.

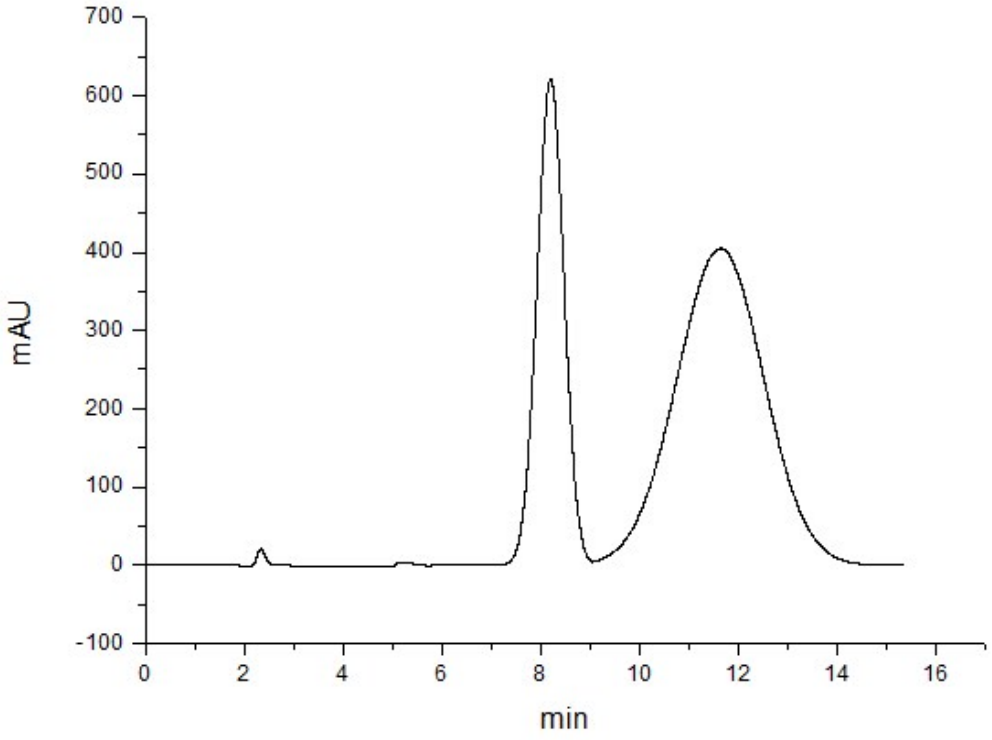

Figure 11. Au: Pd = 1:7, supported on microsphere MnO_2. Conversion: 64%, selectivity: 98%.

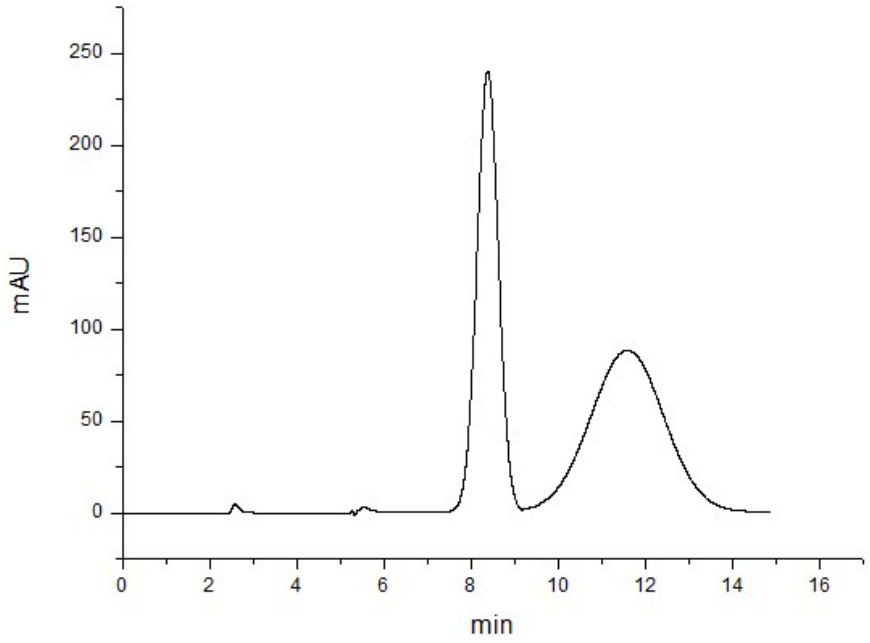

Figure 12. Au: Pd = 1:7, supported on cubic MnO_2. Conversion: 52%, selectivity: 98%.

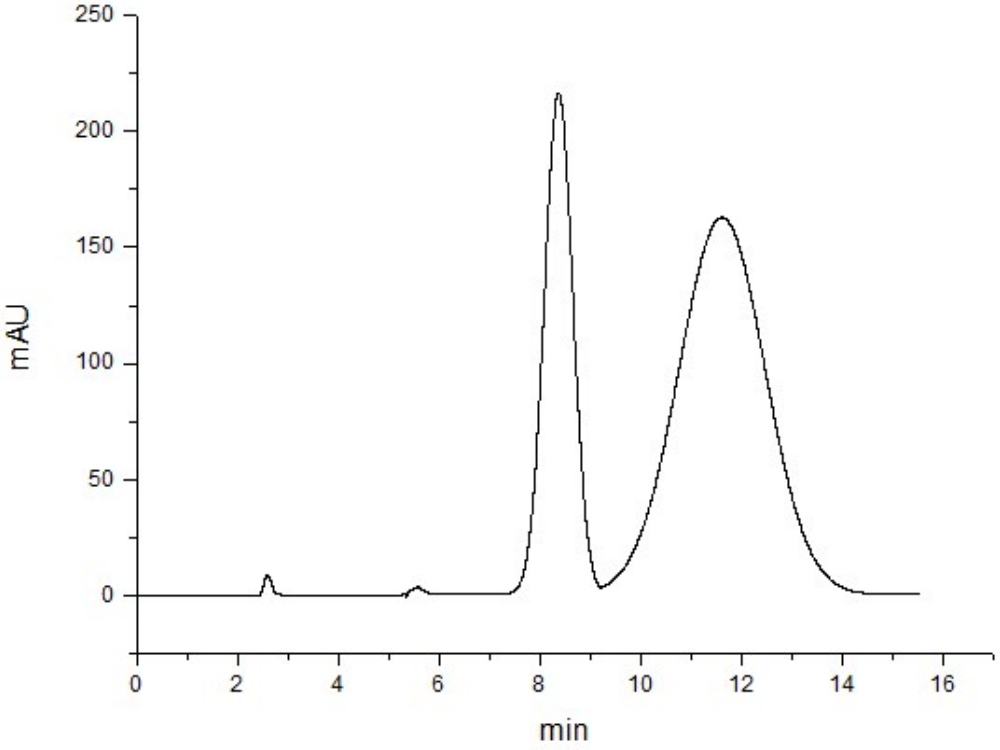

Figure 13.Bare Pd, supported on microsphere MnO_2. Conversion: 70%, selectivity: 97%.

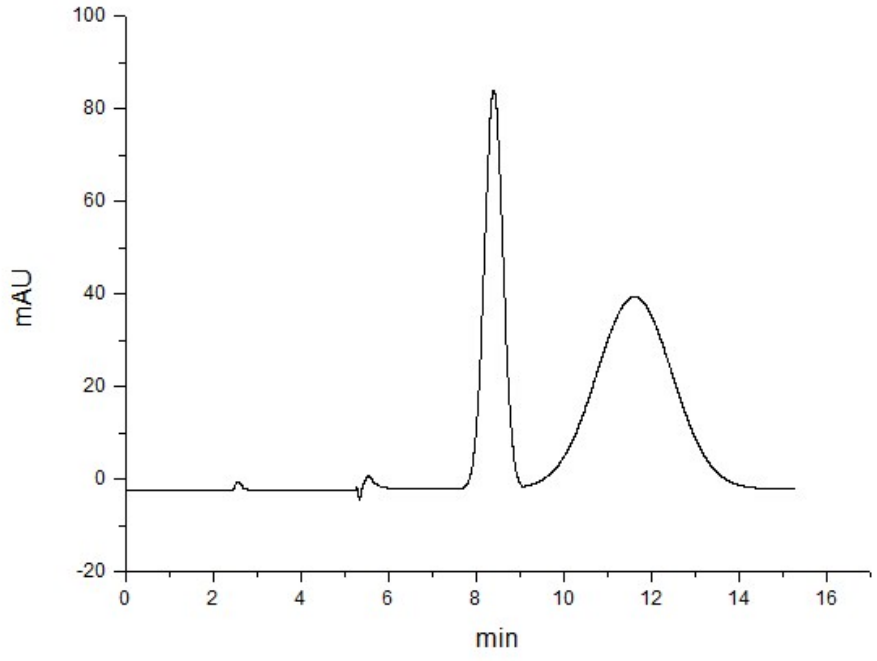

Figure 14.Bare Pd, supported on cubic MnO_2. Conversion: 63%, selectivity: 98%.

2. Effect of bio-reduction temperature

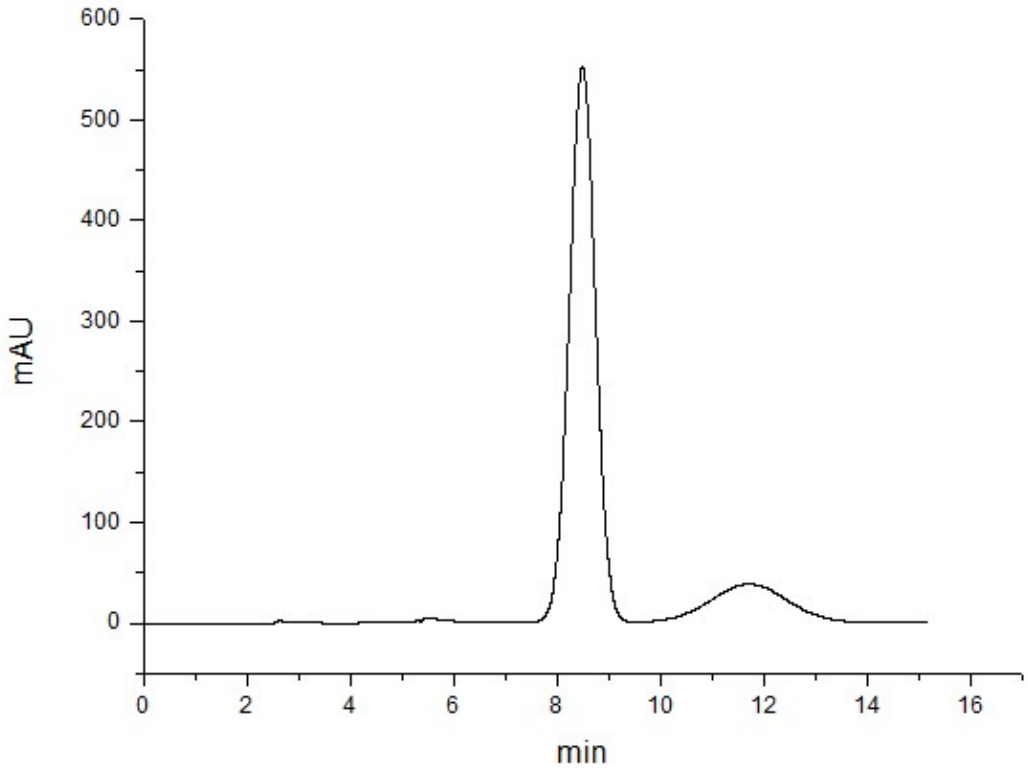

Figure 15. Bio-reduction temperature: 40°C, reaction temperature: 90 °C, Au: Pd=2:1. Conversion: 14%, selectivity: 97%.

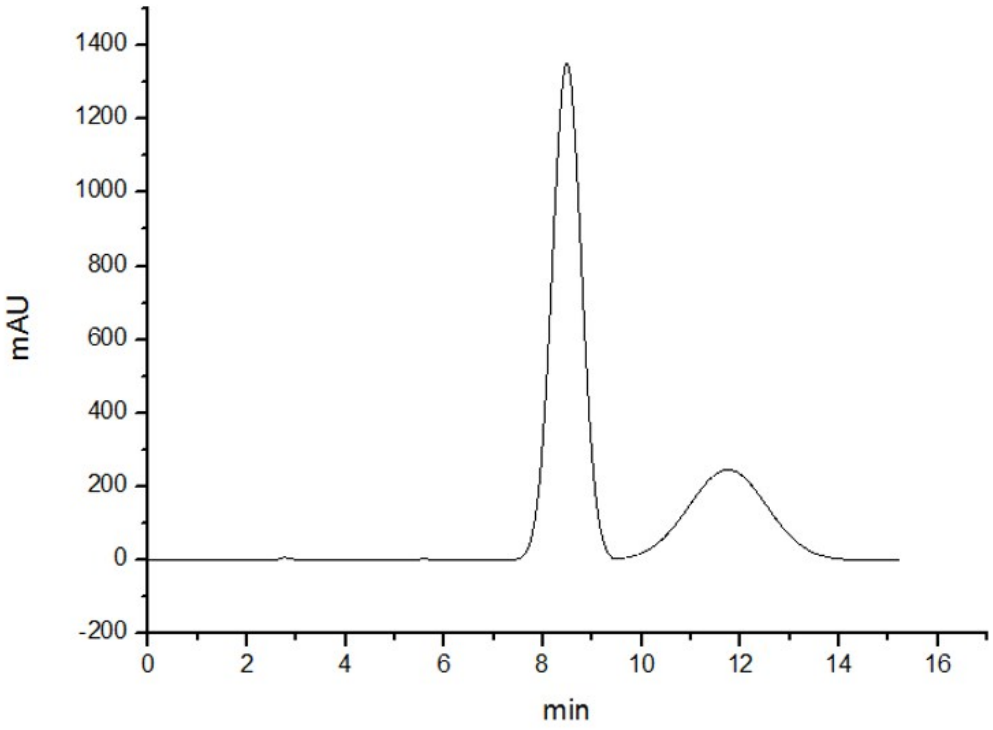

Figure 16. Bio-reduction temperature: 50°C, reaction temperature: 90 °C, Au: Pd=2:1. Conversion: 22%, selectivity: 99%.

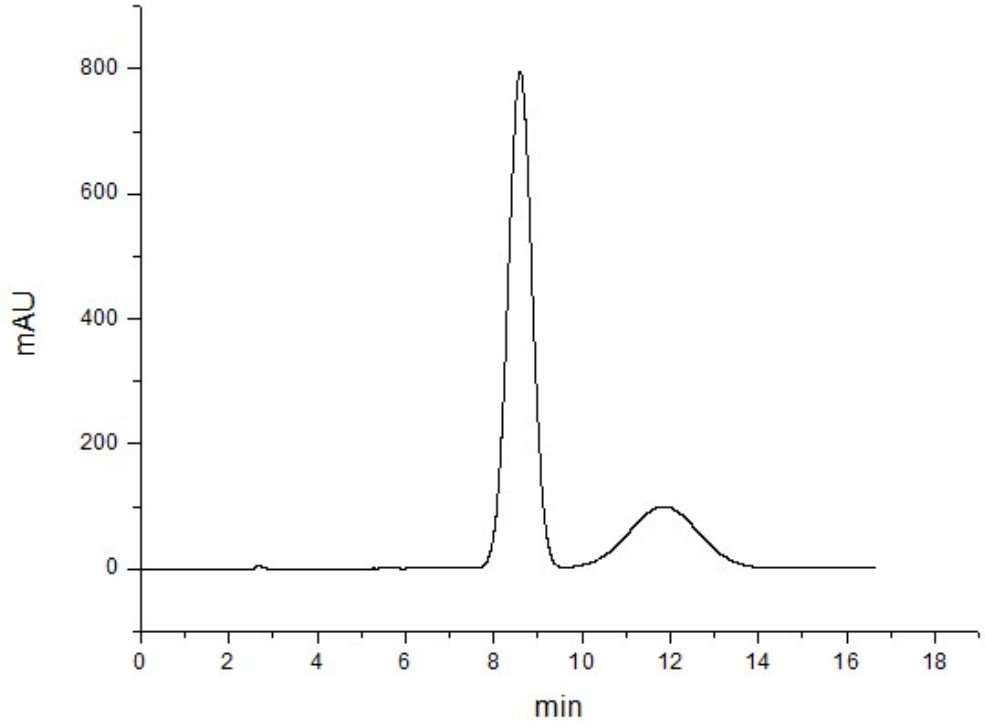

Figure 17. Bio-reduction temperature: 60°C, reaction temperature: 90 °C, Au: Pd=2:1. Conversion: 28%, selectivity: 99%.

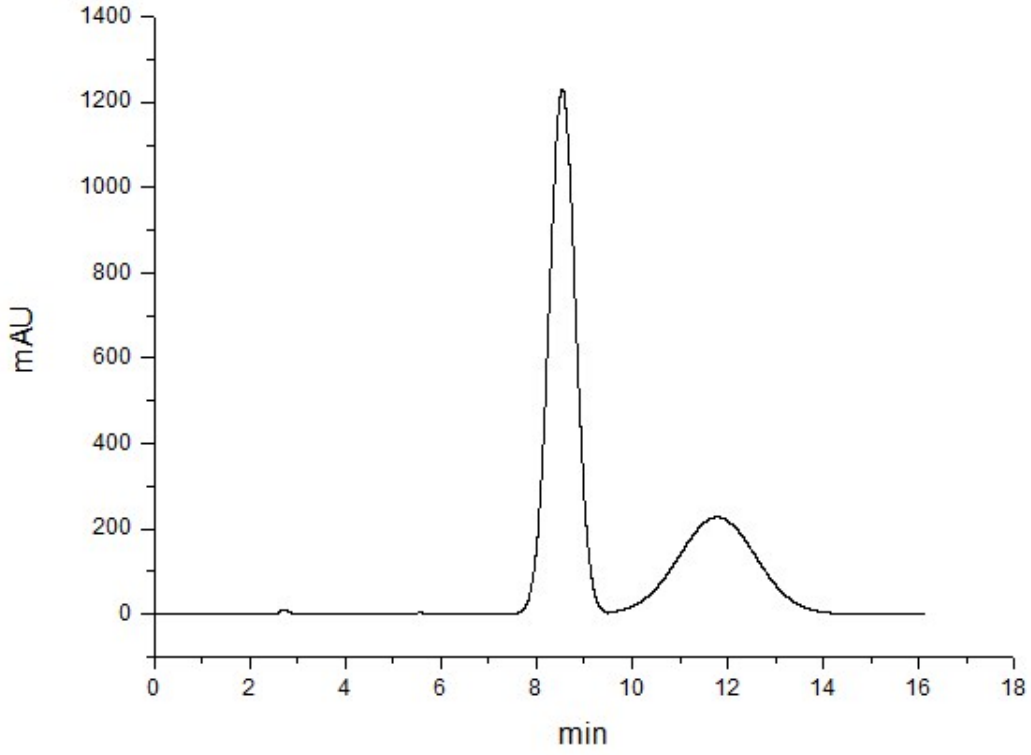

Figure 18. Bio-reduction temperature: 70°C, reaction temperature: 90 °C, Au: Pd=2:1. Conversion: 36%, selectivity: 98%.

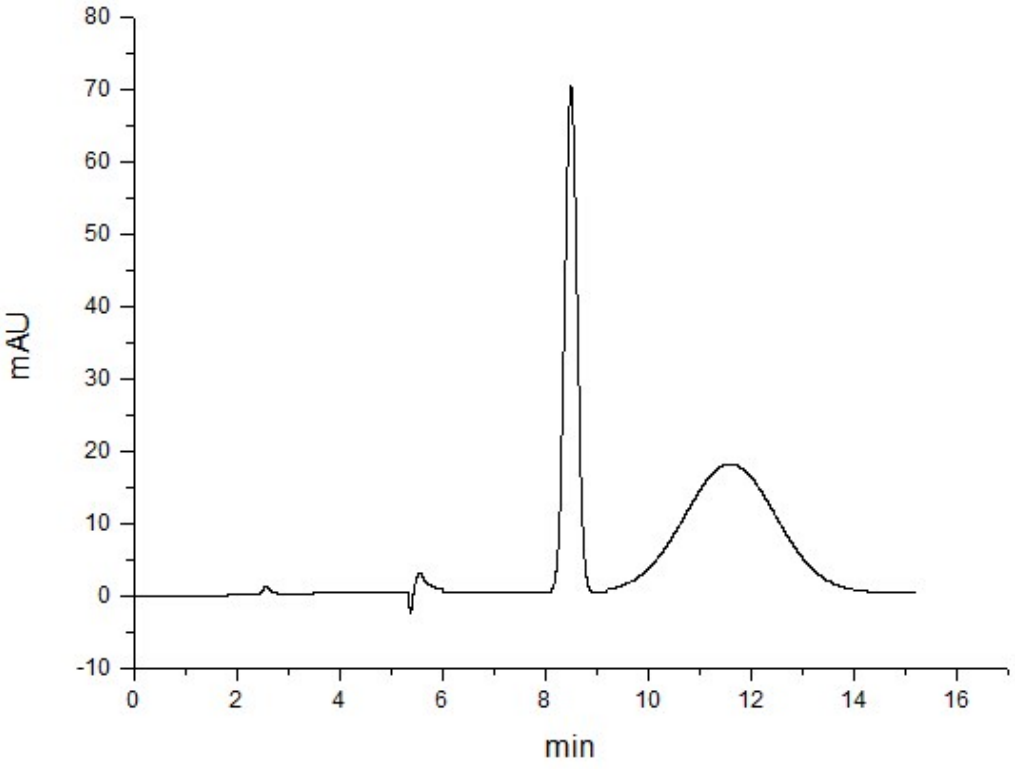

Figure 19. Bio-reduction temperature: 80°C, reaction temperature: 90 °C, Au: Pd=2:1. Conversion: 64%, selectivity: 98%.

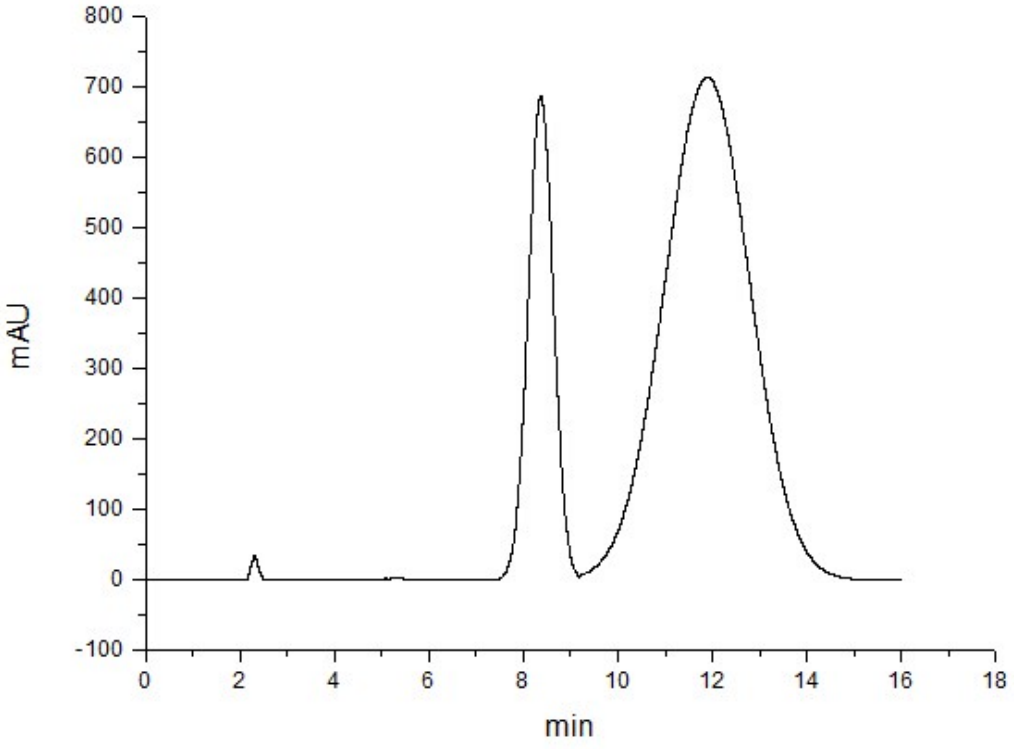

Figure 20. Bio-reduction temperature: 90°C, reaction temperature: 90 °C, Au: Pd=2:1. Conversion: 76%, selectivity: 98%.

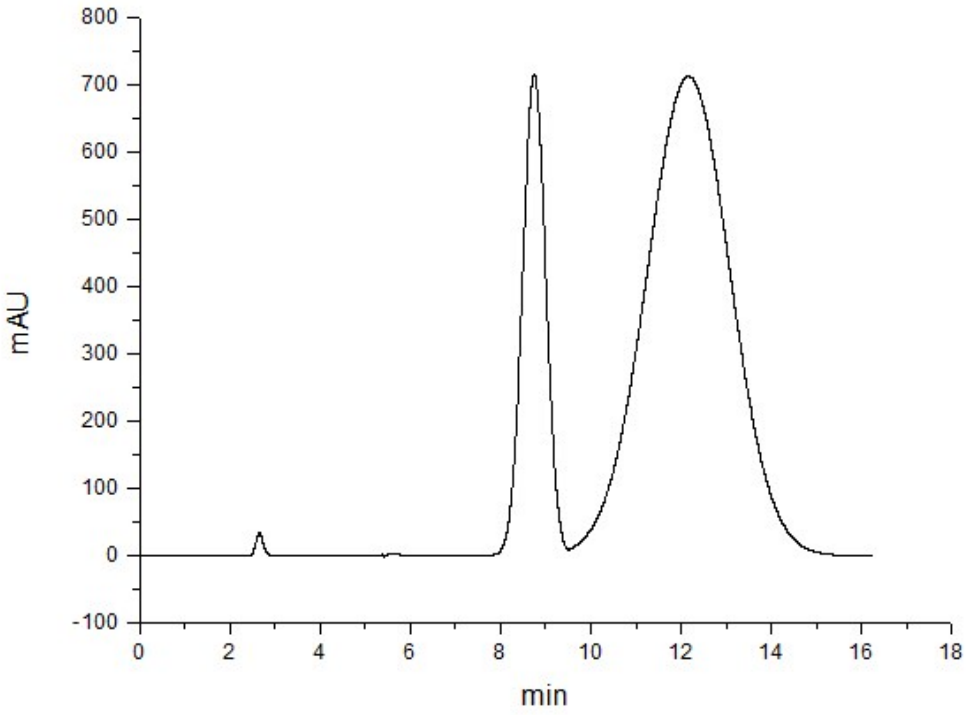

Figure 21. Bio-reduction temperature: 100°C, reaction temperature: 90 °C, Au: Pd=2:1. Conversion: 76%, selectivity: 98%.

3. Effect of reaction temperature

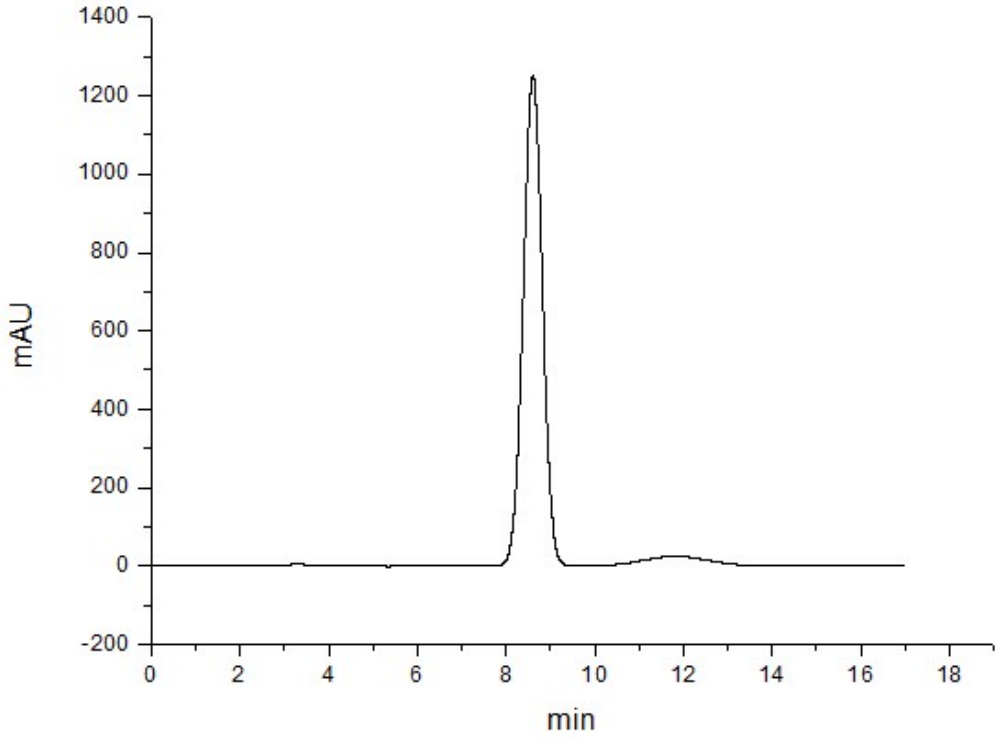

Figure 22. Reaction temperature: 40°C, Bio-reduction temperature: 90 °C, Au: Pd=2:1. Conversion: 4%, selectivity: 99%.

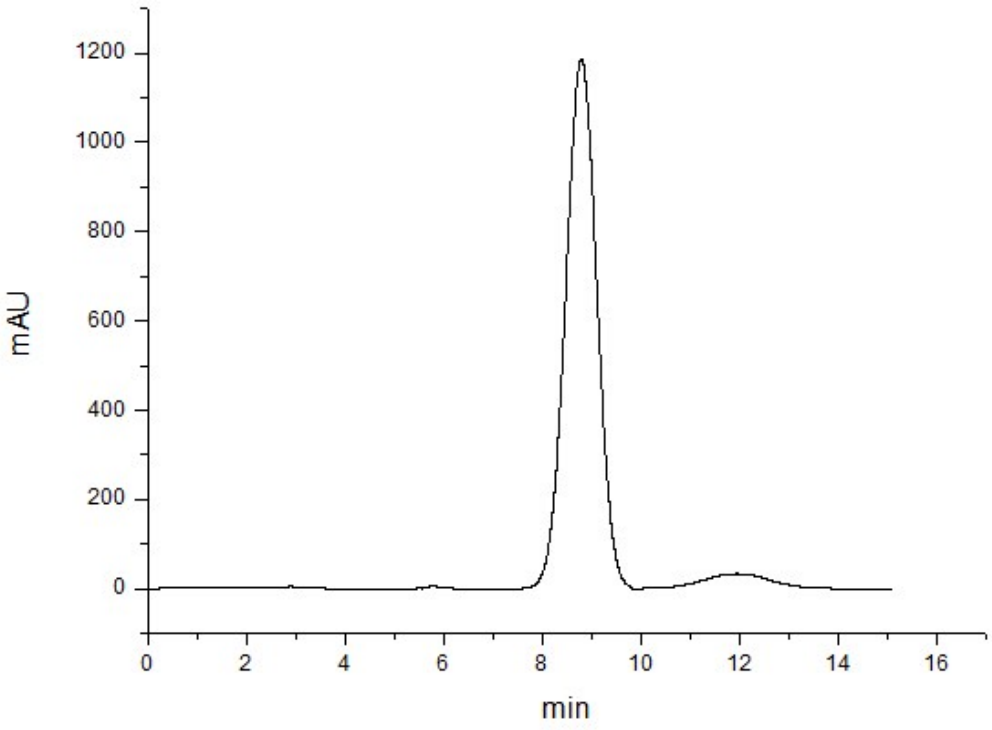

Figure 23. Reaction temperature: 50°C, Bio-reduction temperature: 90 °C, Au: Pd=2:1. Conversion: 4%, selectivity: 99%.

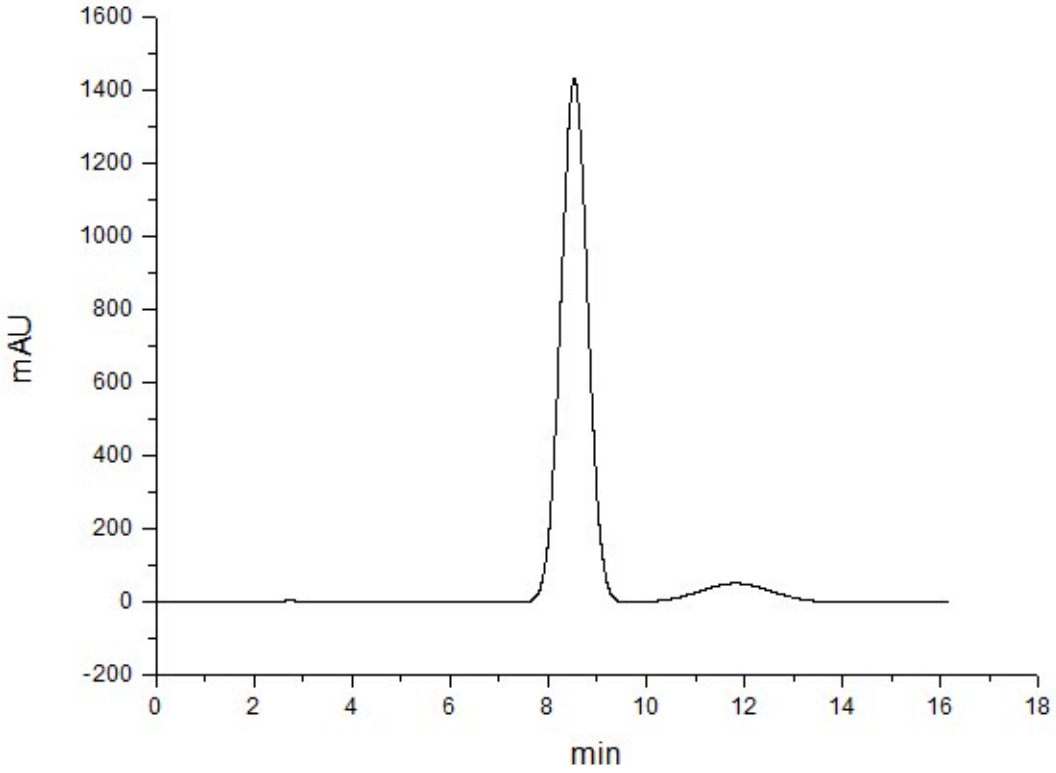

Figure 24. Reaction temperature: 60°C, Bio-reduction temperature: 90 °C, Au: Pd=2:1. Conversion: 6%, selectivity: 99%.

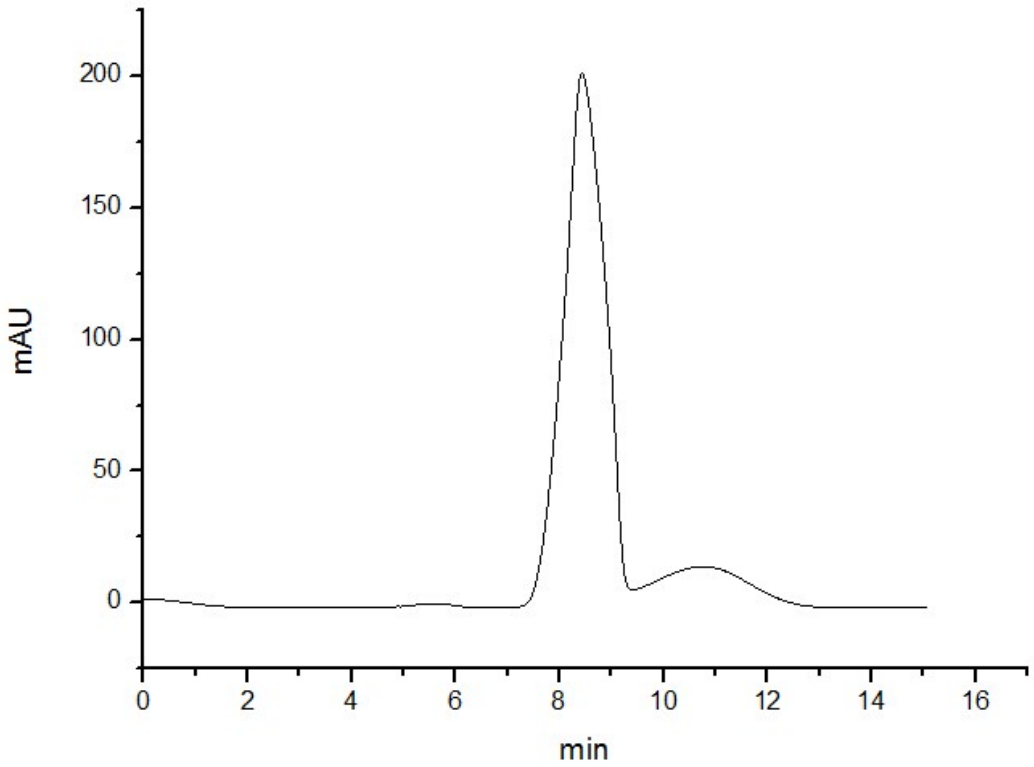

Figure 25. Reaction temperature: 70°C, Bio-reduction temperature: 90 °C, Au: Pd=2:1. Conversion: 11%, selectivity: 98%.

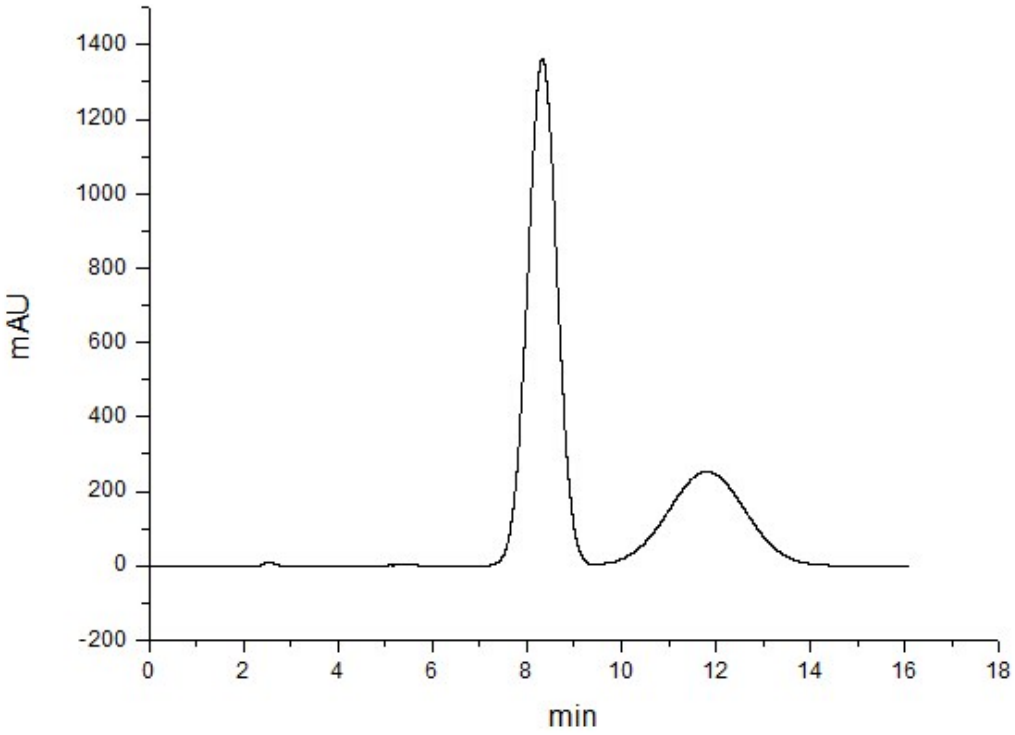

Figure 26. Reaction temperature: 80°C, Bio-reduction temperature: 90 °C, Au: Pd=2:1. Conversion: 34%, selectivity: 98%.

Figure 27. Reaction temperature: 90°C, Bio-reduction temperature: 90 °C, Au: Pd=2:1. Conversion: 76%, selectivity: 98%.

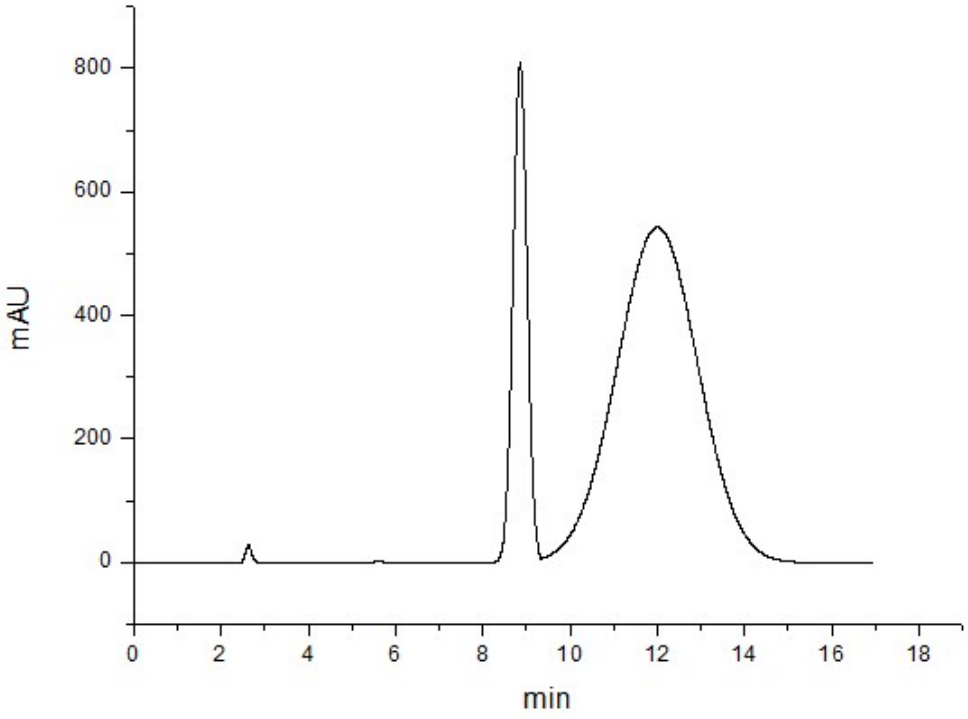

Figure 28. Reaction temperature: 100°C, Bio-reduction temperature: 90 °C, Au: Pd=2:1. Conversion: 76%, selectivity: 98%.