

Article

Development of an Aptamer Based Luminescent Optical Fiber Sensor for the Continuous Monitoring of Hg²⁺ in Aqueous Media

Nerea De Acha ^{1,*}, César Elosúa ^{1,2} and Francisco J. Arregui ^{1,2}

¹ Department of Electrical, Electronic and Communications Engineering, Public University of Navarra, Ed. Los Tejos, Campus Arrosadía s/n, E-31006 Pamplona, Navarra, Spain

² Institute of Smart Cities, Public University of Navarra, Ed. Jerónimo de Ayanz, Campus Arrosadía s/n, E-31006 Pamplona, Navarra, Spain

* Correspondence: nerea.deacha@unavarra.es; Tel: +34-948-166-044

Table 1. Measurement of the pH values and refractive indices of the Hg²⁺ solutions in PBS.

| Hg ²⁺ (M) | pH | Average RI |
|-----------------------|------|------------|
| 0 (PBS) | 7.44 | 1.33456 |
| 5 × 10 ⁻¹² | 7.44 | 1.33454 |
| 10 ⁻¹¹ | 7.46 | 1.33456 |
| 5 × 10 ⁻¹¹ | 7.44 | 1.33454 |
| 10 ⁻¹⁰ | 7.49 | 1.33454 |
| 5 × 10 ⁻¹⁰ | 7.42 | 1.33458 |
| 10 ⁻⁹ | 7.47 | 1.33448 |
| 5 × 10 ⁻⁹ | 7.41 | 1.33466 |

Table 2. Measurement of the pH values and refractive indices of the Hg²⁺ solutions in ultrapure water.

| Hg ²⁺ (M) | pH | Average RI |
|--------------------------------|------|------------|
| 0 (ultrapure H ₂ O) | 4.94 | 1.3333 |
| 5 × 10 ⁻¹² | 5.98 | 1.33326 |
| 10 ⁻¹¹ | 5.93 | 1.33312 |
| 5 × 10 ⁻¹¹ | 5.74 | 1.33334 |
| 10 ⁻¹⁰ | 5.71 | 1.33288 |
| 5 × 10 ⁻¹⁰ | 5.8 | 1.33322 |

Table 3. Measurement of the pH values and refractive indices of the Hg²⁺ solutions in tap water.

| Hg ²⁺ (M) | pH | Average RI |
|--------------------------|------|------------|
| 0 (tap H ₂ O) | 7.85 | 1.3332 |
| 5 × 10 ⁻¹² | 7.89 | 1.33332 |
| 10 ⁻¹¹ | 7.89 | 1.33326 |
| 5 × 10 ⁻¹¹ | 7.91 | 1.33326 |
| 10 ⁻¹⁰ | 7.88 | 1.33324 |