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Jianbin Chao, Kailun Song, Yongbin Zhang, Caixia Yin, Fangjun Huo, Juanjuan Wang, Ting Zhang

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Jianbin Chao[a*], Kailun Song[a,b], Yongbin Zhang[c], Caixia Yin[d], Fangjun Huo[c], Juanjuan Wang[a], Ting Zhang[a]

[a]Scientific Instrument Center, Shanxi University, Taiyuan 030006, China

[b]School of Chemistry and Chemical Engineering, Shanxi University, Taiyuan 030006, China

[c]Research Institute of Applied Chemistry, Shanxi University, Taiyuan 030006, China

[d]Institute of Molecular Science, Shanxi University, Taiyuan 030006, China

*Corresponding author. Jianbin Chao, Scientific Instrument Center, Shanxi University, Taiyuan 030006, P. R. China, Tel.: + 86-351-721 2621; Fax: + 86-351-721 2621. E-mail address: chao@sxu.edu.cn (Jianbin-Chao)

Abstract:

A pyrene-based colorimetric and fluorescent pH probe with large Stokes shift (145 nm) was developed. **PNY** afforded a pK_a of 2.98 and responded linearly to minor pH changes within the range of 2.43 and 3.71. In addition, **PNY** could be used for detecting H^+ with high sensitivity and selectivity, showing colorimetric and fluorometric dual-modal responses with short response time. Furthermore, **PNY** had good photostability, excellent reversibility and cell membrane permeability. Significantly, **PNY** could image acidic pH in A549 cells and visualized extreme acidity in *E. coli* cells.