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A novel "donor-π-acceptor" type fluorescence probe for sensing pH: mechanism and application *in vivo*

Jianbin Chao[a*], Huijuan Wang[a,b], Yongbin Zhang[a], Caixia Yin[c], Fangjun Huo[a], Kailun Song[a,b], Zhiqing Li[a, b], Ting Zhang[d], Yaqin Zhao[c]

[a] Research Institute of Applied Chemistry, Shanxi University, Taiyuan 030006, P.R. China

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

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

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

[*]Corresponding author. Jianbin Chao, Research Institute of Applied Chemistry Shanxi University, Taiyuan 030006, P. R. China. Tel.: ＋86-351-701 7838; Fax: ＋86-351-701 6048. E-mail address: chao@sxu.edu.cn (Jianbin-Chao)

Abstract:

A novel pH fluorescent probe 1-(pyren-1-yl) -3-(6-methoxypridin-3-yl)-acrylketone, (**PMPA**), which had a pyrene structure attached to methoxypyridine, was synthesized for monitoring extremely acidic and alkaline pH. The pH titrations indicated that **PMPA** displayed a remarkable emission enhancement with a pK_a of 2.70 and responded linearly to minor pH fluctuations within the extremely acidic range of 1.26-3.97. Interestingly, **PMPA** also exhibited strong pH-dependent characteristics with pK_a 9.32 and linear response to extreme-alkalinity range of 8.54-10.36. In addition, **PMPA** displayed a good selectivity, excellent photostability and large Stokes shift (165 nm). Furthermore, the probe **PMPA** had excellent cell membrane permeability and was applied