

NOVEL THIAZOLO[2,3-*b*]PTERIDINES AS PROMISING LUMINESCENT PROBES FOR MEDICINE AND BIOLOGY

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Pteridines are an important class of molecules that act as key natural metabolites and are widely used in medical practice as drugs and intermediates in the search for biologically active compounds, biomarkers, and indicators¹⁻³. In recent years, during the screening of biologically active compounds among 6,7-disubstituted-2-thioxo-2,3-dihydropteridine-4(1*H*)-ones, their ability to emit blue light in polar solvents was observed⁴. This finding prompted the search for compounds with luminescent properties within this class. The aim of the present study was the synthesis and investigation of the fluorescent properties of 7-aryl-(hetaryl)iden-10*H*-thiazolo[2,3-*b*]pteridine-8,10(7*H*)-diones, considering their potential application as dyes or fluorescent probes.

It was shown that the target thiazolo[2,3-*b*]pteridines can be obtained via a one-pot three-component condensation of 6-*R*¹-7-*R*²-2-thioxo-2,3-dihydropteridin-4(1*H*)-ones, chloroacetic acid, and aldehyde in an acetic acid–acetic anhydride mixture (Fig. 1).

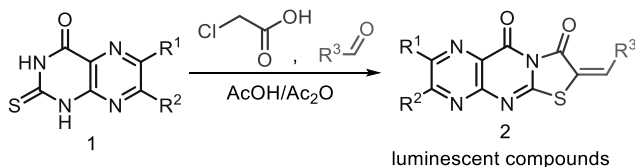


Fig. 1. Synthesis of novel thiazolo[2,3-*b*]pteridines with luminescent properties

The synthesized tricyclic compounds exhibited luminescence with emission maxima in the range of 452–570 nm. The studied compounds demonstrated minimal Stokes shifts (0.5–6.8 %). Fluorescence intensity was found to depend on the nature of the substituent at the 7th position: electron-donating groups caused a loss or significant decrease in luminescence, whereas electron-accepting substituents enhanced emission intensity.

Conclusion: 6-*R*¹-7-*R*²-2-thioxo-2,3-dihydropteridin-4(1*H*)-ones represent a novel and synthetically accessible class of compounds with luminescent properties.

References

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