Optical activity is omnipresent in nature. In the case of porphyrinic compounds, hemoproteins and chlorophylls have been well known for many years. Synthetic chiral porphyrins have also been reported intensively during the last 20 years or so, but the history of optically active phthalocyanines (Pcs) is approximately half that of porphyrins. For the last few years phthalocyaninato metal complexes, as a separate unique class of metal-organic compounds, have found a widespread application not only as pigments, dyes and catalysts but also in medicine, in fields of non-linear optics, chemical analytical sensoring and electronics. The unique structure, chemical and optical properties of Pcs allow them to be biologically and chemically useful macrocyclic compounds. Several derivatives of these compounds have been used as sensitizing agents for photodynamic therapy due to their ability to absorb light in the near-infrared spectral region. For such applications a good solubility in water is preferred. Generally Pc and metalophthalocyanine complexes are not soluble in water or DMSO. Usually, for increase solubility of phthalocyaninato compounds, hydrophilic inorganic or organic groups are attached to phthalocyanine macrocycle. Recently new class of metalophtalocyanines had been synthesed. The water solubility of these complexes is achieved by additional axial organic ligand substituted to the central metal of complex. Besides of water solubility, the axial substitution has several additional effects: I) electronic structure of the phthalocyanine ring N₈ moiety could be altered; II) additional perpendicular to the macrocycle plane dipole moment can be observed; III) new axial ligand vary the spatial relationships between neighboring molecules via steric effects and also change the magnitude of the intermolecular interactions. Most often, in photodynamic therapy, DMSO solutions of phthalocyanine have been used, because DMSO, with the substance dissolved in it, is able to penetrate directly the tissues and cells, and that is the reason for particular attention given to the absorption and emission properties of Pcs in DMSO solutions. In this work we presented a comparative UV-VIS spectral investigation of tens Zr(IV) and Hf(IV) phthalocyanine complexes with gallic, 5-sulfosalicylic and oxalic acids, pyrocatechol, tret-Bu-pyrocatechol and methyl ether of gallic acid as metal coordinated axial ligands in water and organic solvents (MeOH, EtOH, DMSO, DMF, Acetone, CH₂Cl₂ and CHCl₃). Moreover, fluorescent properties of these complexes in DMSO solution have been examined. As for all Pcs, absorbance spectra of axial substituted Zr(IV) and Hf(IV) phthalocyanines are characterized by presence of ultraviolet Soret band (λₘₐₓ are in the range of 335 to 350 nm) and visible Q band (λₘₐₓ are in the range of 675 to 701 nm). The position of λₘₐₓ in the Soret region depends on the solvent polarity - the lower is Reichardt empirical parameter of polarity for solvent, the higher shift of λₘₐₓ into the red is observed. Fluorescent analysis shows that in DMSO solutions, when λₘₐₓ of excitation is 410 or 420 nm, the maxima of emission spectra for all the investigated complexes are located in the range from 725 to 737 nm. Moreover, for the complexes with the same axial ligands, λₘₐₓ of emission for Hf(IV) complexes in relation to λₘₐₓ of emission for Zr(IV) were 10-15 nm shift into the red. The Stocks shifts for researched complexes are about 45 nm.