

Structural Diversity of Co(II)-Coordination Polymers: Prevention and Caring Values on Diabetic Retinopathy by Reducing the Inflammatory Response

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SUMMARY. In this work, two new Co^{II} coordination polymers (CPs) based on a bi-methylene-bridged semi-rigid bis-pyridyl-bis-amide ligand and various polycarboxylates, namely, [Co₂(4-bmbpd)₂(1,3-BDC)₂(H₂O)₄]·5H₂O (**1**) and [Co₂(4-bmbpd)₂(MIP)₂(H₂O)₂]·3H₂O (**2**) [4-bmbpd = N,N'-bis(4-methylenepyridin-4-yl)-1,4-benzenedicarboxamide, 1,3-H₂BDC = 1,3-benzenedicarboxylic acid, H₂MIP = 5-methylisophthalic acid] have been hydrothermally synthesized. The single crystal X-ray diffraction study shows that both complexes show 2D layered structures, which are further extended into the 3D supramolecular structures via the H-bond interactions. Furthermore, the prevention and caring values on the diabetic retinopathy was evaluated and the related mechanism was discussed as well. The content of the Interleukin-6 (IL-6) and Tumor necrosis factor- α (TNF- α) was determined with enzyme linked immunosorbent assay (ELISA). The activation of the Protein Kinase C (PKC) pathway in the retinal cells was detected with real time Reverse Transcription Polymerase Chain Reaction (RT-PCR) assay.

RESUMEN. En este trabajo, dos nuevos polímeros de coordinación CoII (CP) basados en un ligando bis-piridil-bis-amida semirígido con puente bimetileno y varios policarboxilatos, a saber, [Co₂(4-bmbpd)₂(1,3-BDC)₂(H₂O)₄]·5H₂O (**1**) y [Co₂(4-bmbpd)₂(MIP)₂(H₂O)₂]·3H₂O (**2**) [4-bmbpd = N,N'-bis(4-metilenpiridin-4-il)-1,4-benzenodicarboxamida, 1,3-H₂BDC = ácido 1,3-benzenodicarboxílico, H₂MIP = ácido 5-metilisoftálico] se han sintetizado hidrotérmicamente. El estudio de difracción de rayos X de cristal único muestra que ambos complejos muestran estructuras en capas 2D, que se extienden aún más a las estructuras supramoleculares 3D a través de las interacciones del enlace H. Además, se evaluaron los valores de prevención y cuidado de la retinopatía diabética y también se discutió el mecanismo relacionado. El contenido de Interleucina-6 (IL-6) y Factor de necrosis tumoral- α (TNF- α) se determinó con ensayo inmunoabsorbente ligado a enzimas (ELISA). La activación de la vía de la proteína quinasa C (PKC) en las células de la retina se detectó con el ensayo de reacción en cadena de la polimerasa de transcripción inversa (RT-PCR) en tiempo real.

KEY WORDS: coordination polymer, diabetic retinopathy, PKC pathway

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