TIME-RESOLVED RELAXATION DYNAMICS OF NEAR-INFRARED EXCITED ELECTRONIC STATES IN TRANSITION METAL COMPLEXES.

DARYA S. BUDKINA, *Department of Chemistry and Center for Photochemical Sciences, Bowling Green State University, Bowling Green, OH, USA*; SERGEY M. MATVEEV, *Chemistry, University of Illinois at Urbana-Champaign, URBANA-CHAMPAIGN, IL, USA*; CHRISTOPHER M. HICKS, *Department of Chemistry and Center for Photochemical Sciences, Bowling Green State University, Bowling Green, OH, USA*; VENIAMIN A. BORIN, *Physical Chemistry, The Hebrew University, Jerusalem, Israel*; ANDREY S. MERESHCHENKO, *Faculty of Chemistry, Saint-Petersburg State University, Saint-Petersburg, Russia*; ALEXANDER N TARNOVSKY, *Department of Chemistry and Center for Photochemical Sciences, Bowling Green State University, Bowling Green, OH, USA*.

Sub-100 fs time-resolved, broadband transient absorption spectroscopy was employed to investigate ultrafast radiationless relaxation dynamics of near-infrared, metal-centered (MC), electronic excited states of several d^5 and d^9 transition metal complexes (e.g., $CuCl_4{}^{2-}$, $CuBr_4{}^{2-}$, $IrBr_6{}^{2-}$, $IrCl_6{}^{2-}$, etc.) in acetonitrile solution. The results yield insights into the topology of the involved potential energy surfaces, Jann-Teller distortions, and the dynamics through conical intersections connecting the first excited and ground electronic states (energy gap, less than 8000 cm^{-1}). Furthermore, it was found that the addition of water to the solutions efficiently quenches the MC excited states via energy transfer.