Marat V. Markin* (mmarkin@csufresno.edu), 5245 N. Backer Avenue, M/S PB 108, Fresno, CA 93740-8001. On the Smoothness of Weak Solutions of an Abstract Evolution Equation with a Scalar Type Spectral Operator. Preliminary report.

For the abstract evolution equation
\[ y'(t) = Ay(t), \quad t \geq 0, \]
with a scalar type spectral operator \( A \) in a complex Banach space, we find conditions on \( A \) necessary and sufficient for all weak solutions of the equation, which a priori need not be differentiable, to be infinite differentiable or Gevrey ultradifferentiable (in particular, analytic or entire) on \([0, \infty)\) or \((0, \infty)\) and analyze certain effects of their smoothness improvement.

Due to the scalar type spectrality of \( A \), all the foregoing characterizations are formulated exclusively in terms of the location of its spectrum and generalize their analogues obtained earlier for a normal operator \( A \) in a complex Hilbert space. (Received September 16, 2016)