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Rennes, February 15th 2016,

to the scientific secretary of the PhD committee at
the N.N. Vorozhtsov Novosibirsk Institute of
Organic Chemistry of Siberian Branch of Russian
Academy of Sciences

Subject: Testimonial on the abstract of PhD thesis of Arkadii V. Tarasevych “Phase transitions of optically active mixtures of amino acids: enantioenrichment, asymmetric transformations, spontaneous and induced deracemization”

I met Arkadii Tarasevych in 2010 during my visit of the Institute of Bioorganic Chemistry and Petrochemistry (National Academy of Sciences of the Ukraine in Kiev). I delivered a lecture on my recent results at this Institute. At that time I was looking for a PhD student and Arkadii proposed to spend some months in my lab and that was the beginning of a rich collaboration. His PhD subject was reoriented on the subject of common interest we had with Professor A. Sorochinsky and Professor V. Kukhar, his PhD supervisor in Kiev. Our studies were devoted to the phase transitions of natural amino acids and particularly to solid-gas and liquid-solid transitions of enantiomeric mixtures. During the four last years, Arkadii has spent about 18 months in four stays in my lab where he did huge amounts of experiments on the sublimation at low or very high temperature. The low temperature partial sublimation of scalemic mixtures of amino acids had been the subject of different analyses in the recent literature and opposite conclusions had been given. By a systematic study on monosubstituted hydrocarbon derivatives, Arkadii has rationalized the properties of the sublimation in experimental conditions theoretically not far from a thermodynamic equilibrium. After that, Arkadii has moved on very high temperature sublimations of mixtures of amino acids

following the method of Viedma from the Madrid University. He showed the deracemization of mixtures of amino acids in the presence of an enantioenriched derivative, and a unexpected synergistic effect was observed for the most complex mixtures. We correlated these results to a possible enantioenrichment of amino acids, building blocks of life, on the primitive Earth. Four articles in high level journals have already been published on his work. He wrote completely one of them. Most of the results are exhaustively presented in his PhD thesis and in the abstract of the thesis.

Arkadii is a very brilliant student, with a high knowledge of chemistry concerning organic synthesis and space sciences. He was working hard in the lab during the time he spent in France, and is familiar with different analytical methods (particularly with chiral gas chromatographic analysis). Many times he proposed very clever analyses of the experimental results and new experiments to support the hypotheses. In summary, Arkadii is unambiguously one of the best PhD students which worked in my lab, and I am confident that he will have an important contribution to chemistry in a near future. He has unambiguously the level to defend his PhD.

With my best regards,

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A handwritten signature in blue ink, consisting of several fluid, overlapping strokes that form a cursive name.

Dr. Jean-Claude Guillemin