



Univerzita  
Pardubice  
Fakulta  
chemicko-technologická

### Supervisor's Opinion

The dissertation thesis of **Mr. Ahmed Elbeih, M.Sc.**, entitled "*New Energetic Materials: Plastic Explosives on the Basis of Selected Cyclic Nitramines*" was compiled on the basis of MOU between The Egyptian Armament Authority (EAA) and The Faculty of Chemical Technology, University of Pardubice about unpaid realization of three-year PhD study of the above-mentioned postgraduate on the above-mentioned topic.

Immediately after starting the study, Mr. Ahmed Elbeih, M.Sc., began to intensively deal with all necessary activities connected with research work. Using available resources, he prepared a survey of existing findings corresponding with the aim of the work, synthesized the necessary explosives, carried out their purification (in some cases up to the RS-state), suggested and (in cooperation with colleagues from Explosia, a. s.) prepared a number of binders of different composition and prepared an extensive set of plastic explosives.

He submitted the prepared (compressed or extruded) samples to physico-chemical analyses and experimentally determined a number of explosive characteristics (heat of combustion, heat of formation, detonation velocity, sensitivities to impact and friction, effect of cumulative jet, differential thermal analysis, relative explosive strength). He compared these results with calculated values from programs EXPLO5, BKW and Kamlet-Jacobs and found them to mutually agree very well. He found several useful dependences for prediction of new types of primary explosives.

His cooperation in team work and exploitation of working hours were at a very good level. A number of results have already been published in international impact factor journals or presented at international conferences, and one side output of his activities in the framework of appointed theme was submitted for patent protection at the Industrial Property Office in Prague. His fresh and high-quality presentations at the mentioned international conferences meant a respectable representation of The Faculty of Chemical Technology and—in this framework—also respectable representation of his workplace at The Institute of Energetic Materials; at the 13<sup>th</sup> and then also at the 14<sup>th</sup> international seminars NTREM ([www.ntrem.com](http://www.ntrem.com)) he was awarded the first prize in 2010 and 2011 for oral presentations of his results, and at the 14<sup>th</sup> seminar also the second prize for his poster presentation; at the 8<sup>th</sup> Int. Armament Conf. on Scientific Aspects of Armament and Safety Technology – SAAT'2010 in Pultusk, Poland in 2010 he was awarded the prize of Kazimierz Siemienowicz of the III<sup>rd</sup> degree for oral presentation.

With regard to his successfully passing the State Doctoral Examination and excellent publishing activity, Mr. Ahmed Elbeih, M.Sc. fulfils the requirements for defense of his dissertation thesis.

Therefore, as supervisor of study of Mr. Ahmed Elbeih, M.Sc., I univocally recommend the defense of the above-mentioned thesis.

Dec. 7th, 2011

Assoc. Prof. Pavel Vávra, PhD.

*Supervisor*