

Exhibit 10.4-1 Lists of research projects in past five years

Order	Year	Subjects	Budget (Baht)
1	2018	Human development on research for international product identity enhancement in creative economy	17,000,000.00
2	2018	The study of physical properties and colour analysis in pink gold for jewelry process	785,200.00
3	2018	Jewelry and home decoration product development with identity and wisdom: Innovation Hubs for innovative economy establishment 4.0 (creative economy cluster)	1,500,000.00
4	2018	The improvement of hydrogen generator for industry	848,750.00
5	2018	The improvement of management system for Sustainability Company	1,005,000.00
6	2018	Characterization of blue sapphire from Africa	150,000.00
7	2018	Characteristic of garnet from East Africa	785,200.00
8	2018	Potential and access opportunity of blue sapphire resources in Vietnam	1,799,600.00
9	2018	Heat treatment of tsavorite garnet	145,000.00
10	2018	Developing Of Gemology Application For Learning And Diamond And Colored Stones Appraisal	150,000.00
11	2018	Utilization of protein extract from silk cocoon as adsorbent for precious metals in gems and jewelry industrais	145,000.00
12	2018	Fabrication of High toughness of Human Bone Repairing Material from Animal Bone by Plasma and Ion Modifications: Characterization of Physical, Chemical and Mechanical Properties	1,118,000.00
13	2018	The value added of natural yellow sapphires by oxygen ion beam techniques	150,000.00
14	2017	Core competency standard framework development for individual productivity	856,000.00
15	2017	The color development of lead free niello bars	190,000.00
16	2017	The development of platinum alloy for jewelry product	681,000.00
17	2017	Nielloware decorative products with Thai wisdom brand identity	1,500,000.00
18	2017	Nielloware Jewelry without lead: The symbolic identity of Srakeaw province	988,790.00
19	2017	Metal products from Thai gold stoneware using mokume gane technique	984,830.00
20	2017	Natural Tourmaline Nigerien for Value Adding by Plasma Annealing Process	599,940.00
21	2017	Plasma annealing technique applications within SMEs industrial for value adding of natural Nigerian tourmaline	1,213,190.00

22	2017	Characterization of Nigerien Tourmaline from Plasma Annealing Treatment	598,950.00
23	2017	The Developing Compact Plasma Annealing application for Natural Nigerien Tourmaline	2,009,600.00
24	2017	Geotourism Attraction Development at Denchai and Eangchin Districts, Phrae Province	1,520,640.00
25	2016	The processes of bismuth cupel for determination of gold finest by Fire Assay method	150,000.00
26	2016	The polishing process and development of silver-like as alternative products of jewelry industry	527,000.00
27	2016	Quality analysis and evaluation of corundum gemstones from the ion implantation prototype in industrial development technique phase 2 phase	6,500,000.00
28	2016	Niello bar technology for brand and local product development	730,000.00
30	2016	Characteristics and Detection of Corundum Undergone Ion Implantation treatment	1,500,000.00
31	2016	SMEs Compact Ion Beam Implanter Application for Value adding of Natural Gemstone Rubies and Blue Sapphires	1,506,000.00
32	2016	Analysis and modification of spinel by ion beam techniques (2nd yr : Comparisons with modification of spinel by heat treatment and ion beam technique)	960,000.00
33	2016	Modification of Oxygen Plasma Annealing Equipment for Natural Rubellite Value Adding Application	350,000.00
34	2016	The Value Adding of Natural Rubellite by Using Oxygen Plasma Annealing Technique	2,442,000.00
35	2016	The Suitable Stone in Place Casting of Post Natural Green Tourmaline from Oxygen Plasma Heat Treatment	608,000.00
36	2016	A prototype machine of processes and enhancement of lead-free niello bar as export product	834,000.00
37	2016	The Characterisation and Optical Modification of Natural Rubellite	600,000.00
38	2015	Application of oxygen plasma for value adding of natural green tourmaline	150,000.00
39	2015	The oxygen plasma annealing technique for value adding of natural green tourmaline	2,042,000.00
40	2015	The Study of Physical and Optical Properties of Post Natural Green Tourmaline from Oxygen Plasma Annealing for Jewelry Making	601,000.00
41	2015	The Suitable Stone in Place Casting of Post Natural Green Tourmaline from Oxygen Plasma Heat Treatment	608,000.00
42	2015	The polishing process and development of silver-like as alternative products of jewelry industry	527,000.00

43	2014	The synthesis glass-ceramic materials for fashion jewelry industry	394,600.00
44	2014	The study of stone in place casting of natural semi-precious stones and treated semi-precious stones	1,950,000.00
45	2014	Processing and metal types effecting to the prediction of Mokume kane texture	250,000.00
46	2014	The synthesis opal for fashion jewelry from glass-ceramic materials	180,000.00
47	2014	The used of lead-free Fire Assay for determination of gold finest in commercial products	1,000,000.00
48	2014	Applications of Particle Beam Accelerators for Value Adding of Natural Gemstones	215,600.00
49	2014	The optical modification on natural greenish Blue sapphire by nitrogen ion implantation	1,936,660.00
50	2014	Ion beam technology for analysis and modification of natural blue sapphire	1,204,000.00
51	2014	The Corundum gemstone modification by ion implantation technology	1,900,000.00
52	2014	The modification of natural white sapphire for diamond substitute by ion beam techniques	1,337,820.00
		Total	67,728,370.00