PATENT ASSIGNMENT

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| SUBMISSION TYPE: | NEW ASSIGNMENT |
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| NATURE OF CONVEYANCE: | ASSIGNMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|----------------------|----------------|
| Yan Shao | 08/31/2011 |
| Martin D. Tabat | 08/31/2011 |
| Christopher K. Olsen | 08/31/2011 |
| Ruairidh MacCrimmon | 08/31/2011 |

RECEIVING PARTY DATA

| Name: | TEL Epion Inc. |
|-----------------|-----------------|
| Street Address: | 37 Manning Road |
| City: | Billerica |
| State/Country: | MASSACHUSETTS |
| Postal Code: | 01821 |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 13223758 |

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| ATTORNEY DOCKET NUMBER: | EP-193 |
|-------------------------|-------------|
| NAME OF SUBMITTER: | Eric Strang |

Total Attachments: 2

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REEL: 026844 FRAME: 0977

PATENT

ASSIGNMENT OF INVENTION AND PATENTS THEREON

For valuable consideration, I/we, Yan SHAO, Martin D. TABAT, Christopher K. OLSEN & Rauridh MACCRIMMON, hereby assign to TEL Epion Inc., a Corporation of Delaware and having a place of business at 37 Manning Road, Billerica, Massachusetts 01821, and its successors and assigns (collectively hereinafter called "the Assignee"), my entire right, title and interest throughout the world in the inventions and improvements which are subject of an application for United States Patent filed herewith, entitled GAS CLUSTER ION BEAM ETCHING PROCESS FOR Si-CONTAINING AND Ge-CONTAINING MATERIALS. and filed 09/01/2011 as Patent Application No. 13/223,758 preparatory to obtaining Letters Patent of the United States therefore, this assignment including said application, any continuation, division or continuation-in-part thereof and/or substituted therefore, any and all United States and foreign patents, utility models, and design registrations granted for any of said inventions or improvements, and the right to claim priority based on the filing date of said application under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, the European Patent Convention, and all other treaties of like purposes; and authorize the Assignee to apply in all countries in my name or in its own name for patents, utility models, and design registrations and like rights of exclusion and for inventors' certificates for said inventions and improvements; and agree for myself and my heirs, legal representatives and assigns, without further compensation to perform such lawful acts and to sign such further applications, assignments, Preliminary Statements and other lawful documents as the Assignee may reasonably request to effectuate fully this Assignment. I hereby authorize and request that any one of the attorneys or agents of Tokyo Electron U.S. Holdings, 2400 Grove Boulevard, Austin, Texas 78741, to insert herein the filing date and application serial number of said application when known.

| Inventor's Si | لر gnature: | lan shoo- | Date: _ | 8/31/11 | |
|---------------|----------------|-----------|---------|---------|--|
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