

Correlation of Acceleration Voltage and Nano Scale Spot Size for Future Science and Technology

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Abstract: Acceleration voltage, spot size and Height size are correlated at various Acceleration voltages of 5kv, 10Kv, 15Kv, 20Kv and 30Kv. Spot size is measured at various Nano scale ranges of 5nm, 10nm, 15nm and 20 nm. Z Height distance is measure in micro scale ranges at 8μm, 10μm, 20μm and 30μm. At every Range of Acceleration voltage, Spot size and Z Height distance are correlated and studied with Different SEM Images using Scanning Electron Microscope (SEM).

Keywords: Acceleration voltage, Spot size, Z Height distance, Scanning Electron Microscope.

I. INTRODUCTION

The SEM is a magnifying instrument that works by filtering a zeroed in light emission on an example of interest. The electron pillar originates from a fiber, which is made of a few kinds of materials. Tungsten fastener weapon is the most well-known of these materials. This fiber is a circle of tungsten which goes about as the cathode. A voltage is applied to the circle, making it heat up. The anode, which is positive regarding the fiber, shapes ground-breaking alluring powers for electrons. This makes electrons quicken toward the anode. Lanthanum Hexaboride fibers and field outflow weapons are different instances of fibers. The EDS x-beam finder gauges the overall plenitude of transmitted x-beams versus their vitality. The indicator is commonly a lithium-floated silicon, strong state gadget. At the point when an occurrence x-beam strikes the identifier, it makes a charge beat that is relative to the vitality of the X-beam.

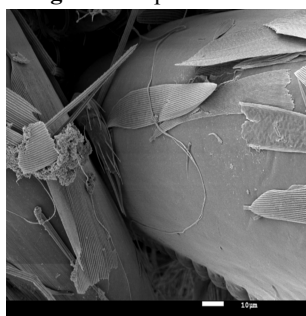
A charge-touchy preamplifier changes over the charge heartbeat to a voltage beat (which stays relative to the x-beam vitality). At that point, the sign is sent to a multichannel analyzer where the beats are arranged by voltage. The vitality, as decided from the voltage estimation, for every episode x-beam is sent to a PC for show and further information assessment. To decide the essential sythesis of the inspected volume, the range of X-beam vitality versus tallies is assessed

II. METHODOLOGY

Table 1: Acceleration Voltage: 5 KV

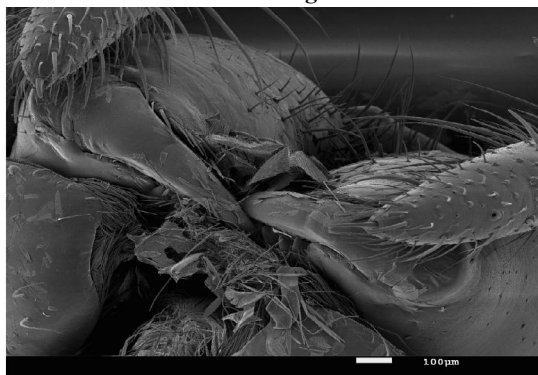
Sr. No	Acceleration Voltage (Kilo Volts)	Spot Size (nm)	Z Height Distance (mm)
1	5	5	8
2	5	10	10
3	5	15	20
4	5	20	30

SEM Image-1: Sample dimension 10 μm



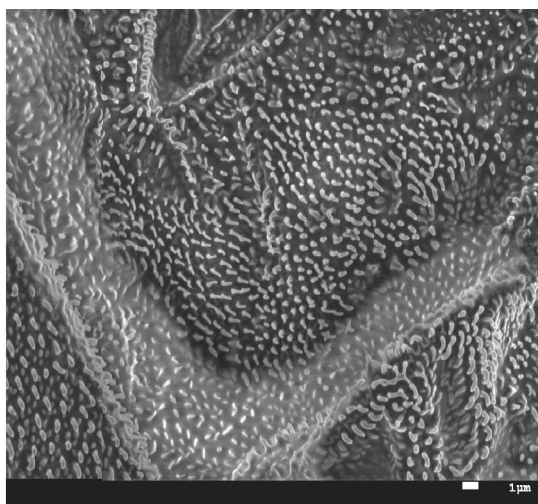
This SEM Image explains Acceleration Voltage of 5 kv, Spot size of 5 nm and height distance of 8 mm

SEM Image-2

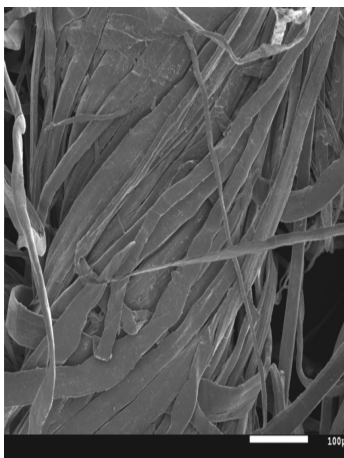


This SEM Image explains Acceleration Voltage of 5 kv, Spot size of 10 nm and height distance of 10 mm

SEM IMAGE-3:



SEM IMAGE-4:

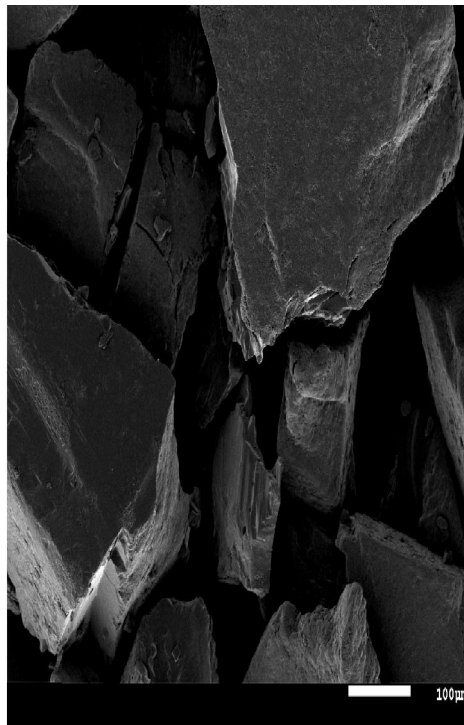


Sem Image-4 explains about Acceleration voltage of 5 kv, Spot size 20 nm and Hieght 30 μm Sample dimension 100 μm

TABLE 2: Acceleration voltage: 10 Kv

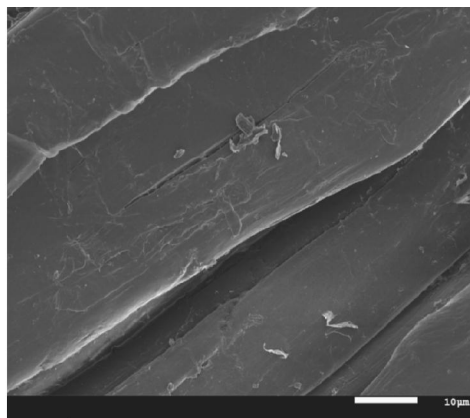
Acceleration Voltage KV	Spot Size nm	Z Height Distance μm
10	5	8
10	10	10
10	15	20
10	20	30

SEM IMAGE-5:



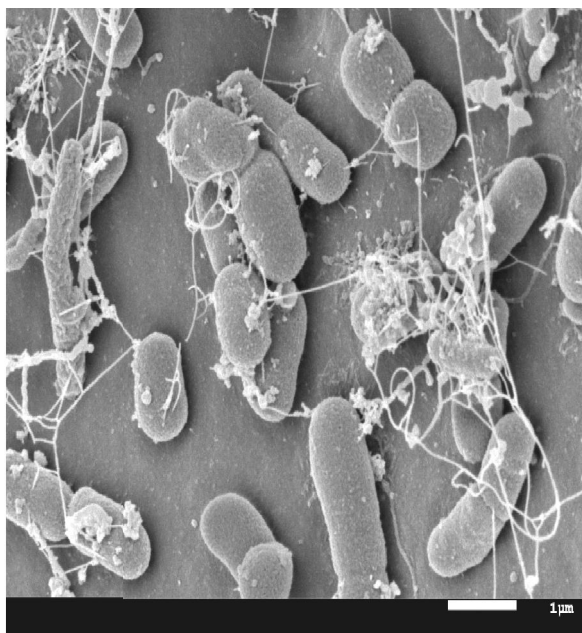
SEM Image-5 explains about Acceleration voltage at 10 KV, Spot size 5 nm and Z Height Distance 8 μm . Sample dimension is 100 μm

SEM IMAGE-6



SEM Image-6 explains about Acceleration voltage 10 KV, Spot size 10 nm and Height distance 10 μm . Sample dimension is 10 μm

SEM IMAGE-7:



SEM Image 7 Explains about Acceleration voltage 10 ev, Spot size 15 nm and z Height Distance 20 μm. Sample dimension is 1 μm

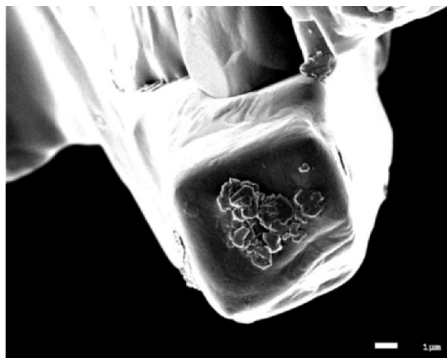
SEM IMAGE-8:



TABLE 3: Acceleration voltage: 15 Kv

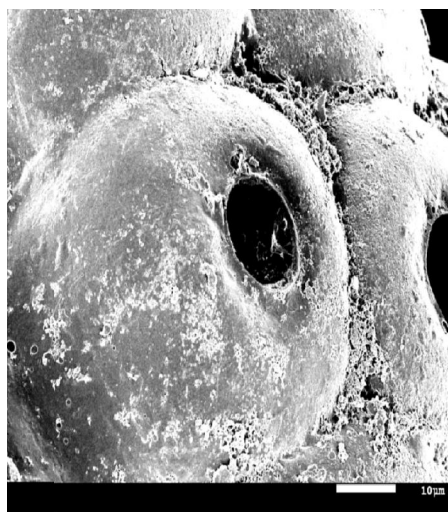
Acceleration Voltage KV	Spot Size Nm	Z Height Distance μm
15	5	8
15	10	10
15	15	20
15	20	30

SEM IMAGE-9:



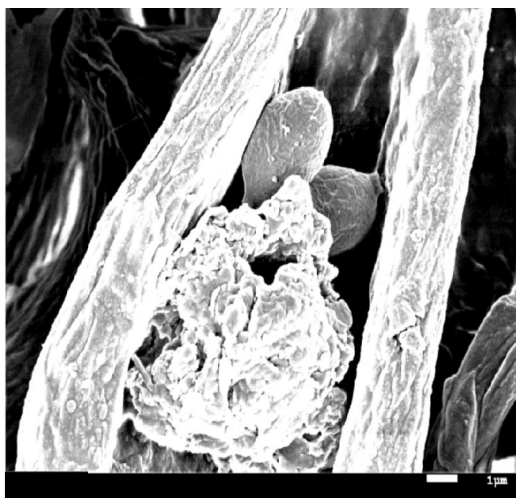
Accelerating voltage-15 kv with Spot size 5 nm

SEM IMAGE-10:



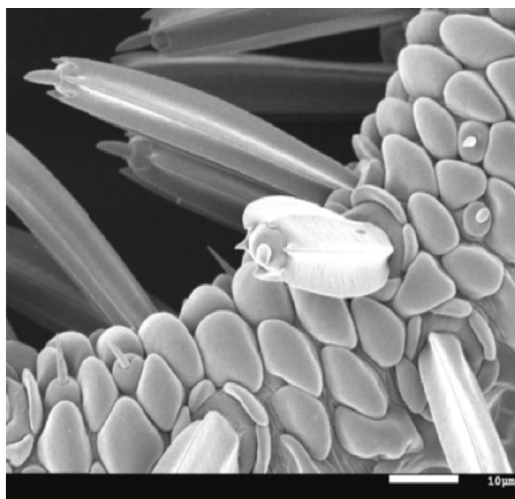
Accelerating voltage-15 kv with spot size 10 nm

SEM IMAGE-10:



Accelerating voltage-15 kv with spot size 15 nm

SEM IMAGE-11:

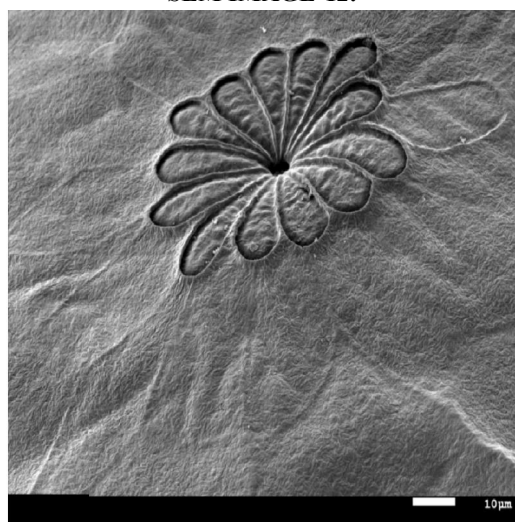


Accelerating voltage-15 kv with spot size 20 nm

TABLE 4: Acceleration voltage: 20 Kv

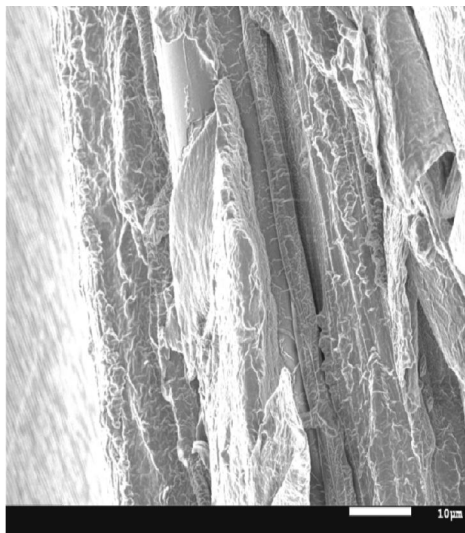
Acceleration Voltage KV	Spot Size Nm	Z Height Distance μm
20	5	8
20	10	10
20	15	20
20	20	30

SEM IMAGE-12:



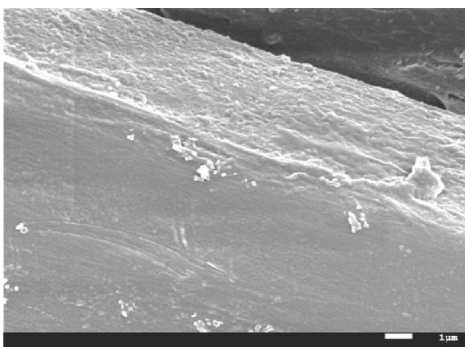
Accelerating voltage-20 kv with spot size 5 nm

SEM IMAGE-13:



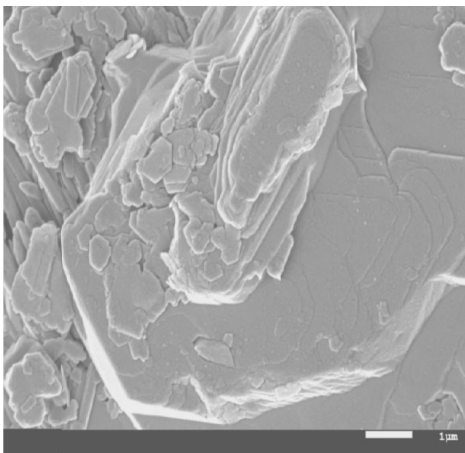
Accelerating voltage-20 kv with spot size 10 nm

SEM IMAGE-14:



Accelerating voltage-20 Kv with spot size 15 nm

SEM IMAGE-15:

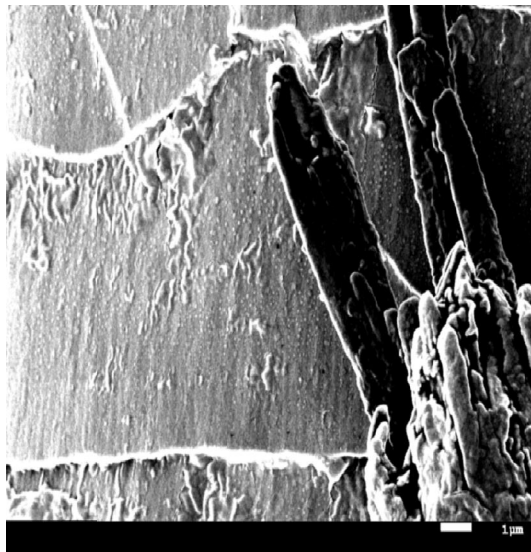


Accelerating voltage-20 kv with spot size 10 nm

TABLE 5: Acceleration voltage: 30 Kv

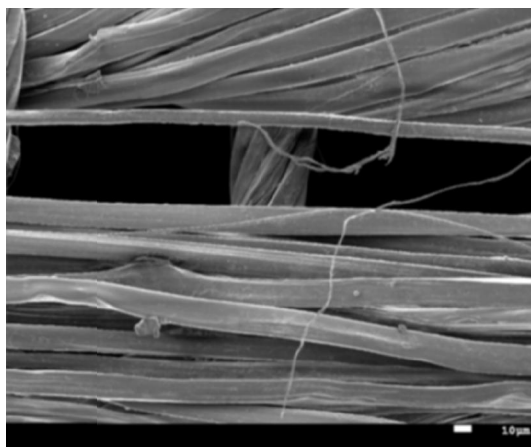
Acceleration Voltage KV	Spot Size Nm	Z Height Distance μm
30	5	8
30	10	10
30	15	20
30	20	30

SEM IMAGE-16:



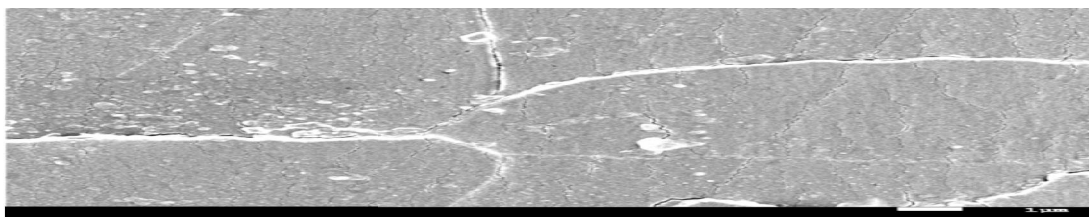
Accelerating voltage-30 kv with spot size 5 nm

SEM IMAGE-17:



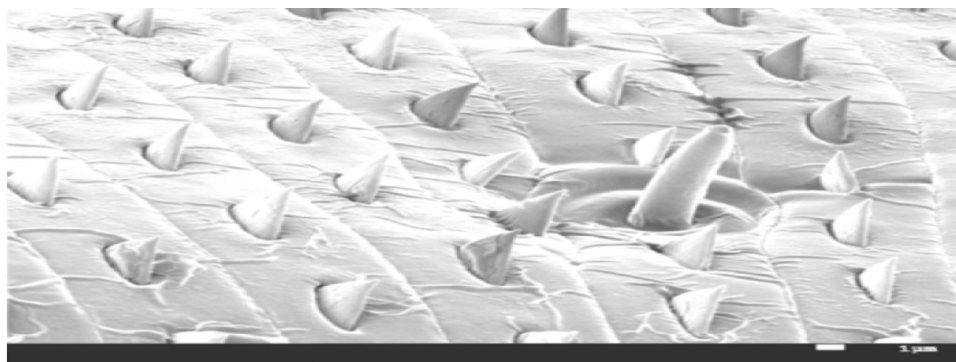
Accelerating voltage-30 kv with spot size 10 nm

SEM IMAGE-18:

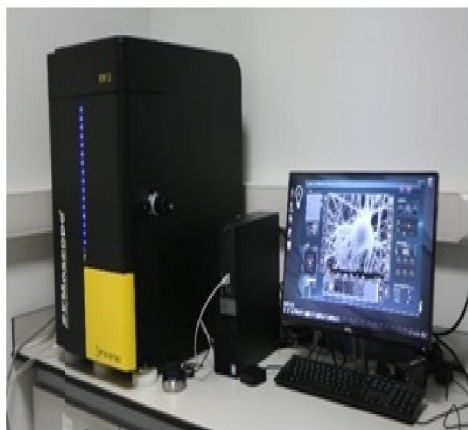


Accelerating voltage-30 kv with spot size 20 nm

SEM IMAGE-19:



Accelerating voltage-30 kv with spot size 30 nm



III. APPLICATIONS IN MODERN TECHNOLOGY

Uses of electron microscopy, independent and in blend with other microscopy techniques, in various fields of organic and clinical exploration just as in clinical finding will be one of the principle subjects at the Microscopy Conference (MC 2007), to be held from 2 to 7 September 2007 at the Saarland University in Saarbrücken (Germany). This is the 33rd Conference of the Deutsche Gesellschaft für Elektronenmikroskopie e. V. (DGE), which was at first considered as a public gathering yet has accomplished as of late an amazing global character. In light of the encounters in past gatherings, around 500 members and more than 20 exhibitors are normal in Saarbrücken. This meeting is a significant logical feature for the Saarland University, concurring with the festivals of the 60th commemoration of its establishment by the French organization in 1947.

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