

MICROFABRICATION FOR MICROFLUIDICS

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What are the fabrication techniques for microfluidic devices? Different microfluidic fabrication techniques One based on etching, wet or dry, usually used to make silicon or glass microfluidic chips, the second with thermoforming techniques such as hot/roll embossing and injection molding. The third family is the direct writing thanks to micro machines or laser.

What are the procedures for microfluidics? Microfluidics systems/devices work by using a pump and a chip. Different types of pumps precisely move liquid inside the chip with a rate of 1microliter per minute to 10,000 microliters per minute. For comparison's sake, a small droplet of water is approximately 10 microliters.

What is microfabrication used for? These objects can have miniature moving parts, stationary structures, or both. Microfabrication has been used for many applications in biology and medicine. These applications fall into four domains: tools for molecular biology and biochemistry, tools for cell biology, medical devices, and biosensors.

Why is PDMS good for microfluidics? PDMS is a commonly used material in academic microfluidic labs due to advantageous properties such as transparency, biocompatibility, and relative ease of replication.

What are the 3 main fabrication techniques? Three popular techniques for metal fabrication are cutting, forming, and welding. These fabrication techniques can be further divided into sub-categories like laser cutting and shearing, forming methods like bending and stretching, and welding techniques like MIG and TIG welding.

What are the different types of lithography techniques used in microfabrication? Microfabrication by patterning is based on lithography techniques (or micro printing). It involves (i) photolithography and (ii) soft lithography. (i) Photolithography (also known as optical lithography) is a process used to selectively remove parts of a thin film (or bulk of a substrate).

What are the techniques of microfluidics? Microfluidic techniques such as droplet microfluidics, paper microfluidics, and lab-on-a-chip are used in the realm of food science in a variety of categories. Research in nutrition, food processing, and food safety benefit from microfluidic technique because experiments can be done with less reagents.

What can I use instead of PDMS microfluidics? The Flexdym™ polymer is the best alternative to PDMS and the first material specifically tailored for microfluidics chip fabrication.

What software is used for microfluidic devices? FLUI'DEVICE software is an easy friendly and useful tools for a quick and reliable analyze of fluids behavior inside microfluidic chips.

What are the examples of microfabricated devices? Fields of use microfluidic devices (ink jet print heads) solar cells. flat panel displays (see AMLCD and thin-film transistors) sensors (microsensors) (biosensors, nanosensors)

Which process is the heart of microfabrication? Photolithography is one of the most widely used microfabrication techniques for creating features on a photo-sensitive chemical, called photoresist, spin coated over a substrate (usually silicon or glass).

Why is photolithography so important for microfabrication? It provides precise control of the shape and size of the objects it creates. It can create patterns over an entire wafer in a single step, quickly and with relatively low cost. In complex integrated circuits, a wafer may go through the photolithographic cycle as many as 50 times.

What is the best tubing for microfluidics? Microfluidic PTFE Teflon tubing (Polytetrafluoroethylene, often described as Teflon® tubing): This transparent,

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chemically inert and non-toxic material features unmatched chemical resistance and a surface that facilitates flow. Due to its high flexibility, PTFE is mostly used in low pressure applications.

How do you prepare PDMS for microfluidics? Preparing the PDMS is very straightforward. Sylgard 184 silicone base and curing agent are mixed in a 10:1 ratio by weight. Then the mixture is degassed to remove any bubbles and poured over the PDMS master. The PDMS is then baked under vacuum, causing it to cure and ensuring all entrapped gasses are evacuated.

What is the disadvantage of microfluidic device? Complexity: Microfluidic devices can be complex to design and fabricate, requiring specialized knowledge and equipment. Scale-up: While microfluidic devices are effective for small-scale experiments, scaling up to larger production volumes can be challenging.

What are 5 examples of fabrication? Cutting, punching, forming, shearing, stamping, welding are common fabrication techniques used to shape, cut, or mold raw metal material into a final product. Fabrication is distinct from other manufacturing processes.

What are the 9 ways to better fabrication?

What is the three 3 major steps of fabrication flow? The fabrication process includes three main areas: wafer creation, circuit construction, and packaging.

Why is yellow light used in lithography? In a photolithographic environment, a so-called “yellow room,” there is usually a yellow light to prevent the initiation of a photoreaction of PR; this light is made by filtering the wavelength regions shorter than 500 nm and using only yellow emitting materials.

Which is the most common lithography technique used? Optical lithography is the most common top–down patterning method that allows for cost-efficient, high-volume fabrication of microelectronic and nanoelectronic devices.

What are the new techniques of lithography? Recently, various advanced lithographic techniques have been introduced including short-wavelength photolithography, electron beam lithography [11], X-ray lithography, and ion beam lithography [12].

How to fabricate microfluidics? Most famous process for casting microfluidic parts is called soft-lithography. A two-part silicone resin called PDMS is poured into molds, cured, and de-molded. PDMS produces the highest fidelity and best quality of micro-features between all manufacturing technologies used for Microfluidics.

Why is PDMS used in microfluidics? It is deformable, which allows the integration of microfluidic valves using the deformation of PDMS micro-channels, the easy connection of leak-proof fluidic connections and its use to detect very low forces like biomechanics interactions from cells.

What are the basic principles of microfluidics? Basic Principles of Microfluidics Due to the small dimensions of microchannels, the Re is usually much less than 100, often less than 1.0. In this Reynolds number regime, flow is completely laminar and no turbulence occurs. The transition to turbulent flow generally occurs in the range of Reynolds number 2000.

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What are the methods of fabrication process? Fabrication is the process of transforming raw metal materials into finished or semi-finished products. Cutting, shaping, or molding metal are just some of the fabrication processes used in the industry. It can be carried out either on-site or in specialized workshops equipped with advanced machines and tools.

How are microfluidic channels fabricated? The approaches for microfluidic device fabrications are described in terms of low volume production (casting, lamination, laser ablation, 3D printing) and high-volume production (hot embossing, injection moulding, and film or sheet operations).

What are the techniques of IC fabrication? The Integrated Circuit fabrication process starts by cutting a thin silicon ingot into individual IC chips. The silicon ingot is a piece of silicon. Then, the wafer is cut into small pieces by a precision cutting

machine. These chips are then assembled and tested.

How can microfluidic and microfabrication approaches make experiments more physiologically relevant? Microfabricated and microfluidic devices enable standardized handling, precise spatiotemporal manipulation of cells and liquids, and recapitulation of cellular environments, tissues, and organ-level biology.

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How to design a microfluidic channel? This could be a square, rectangle, circle, semi-circle, or trapezoid. Design Tips: Avoid circular cross section. The microfluidic channels are made by layering. This means to make a circular cross section, two semi-circular channels need to be perfectly aligned on top of each other.

Which is difficult to fabricate in IC? Concept: In IC fabrication it is difficult to fabricate capacitors due to the following reasons: A large area is required on the chip for a large value of the capacitor (in mF or μ F). Leakage problem because dielectric is present between the plates of the capacitor.

What are the fabrication techniques for paper based microfluidic devices?

Is most difficult to fabricate in an IC? Usually, the toughest component to fabricate in an integrated circuit IC is the capac...

Unveiling the Intriguing "The Bite in the Apple"

"The Bite in the Apple: A Memoir of My Life with Steve Jobs" is a captivating memoir chronicling Chrisann Brennan's tumultuous and formative relationship with the legendary co-founder of Apple. This intimate account offers a unique perspective on Steve Jobs' personal life, his technological genius, and the profound impact he had on both Chrisann and the world.

Q: Who is Chrisann Brennan and what is her significance in relation to Steve Jobs? A: Chrisann Brennan was Steve Jobs' first love and long-term girlfriend. They dated throughout high school and college and had a daughter, Lisa, together. Chrisann's experiences with Jobs provide a firsthand account of his early life, his ambition, and his struggles.

Q: What is the central theme of "The Bite in the Apple"? A: The memoir explores the complex relationship between Chrisann and Steve Jobs. It delves into the intense love and admiration they shared, along with the challenges and obstacles that ultimately led to their separation. Chrisann's narrative paints a nuanced portrait of Jobs and reveals how his personal life influenced his professional decisions.

Q: How does Chrisann's perspective differ from other accounts of Steve Jobs? A: Chrisann's perspective offers a unique and intimate glimpse into Jobs' personal

life, especially during his formative years. As his first girlfriend, she witnessed his youthful idealism, his relentless drive, and his deep love for technology. Her firsthand experiences provide a valuable counterpoint to the more public and often idealized narratives of Jobs' life and work.

Q: What are the key insights that readers can gain from "The Bite in the Apple"? A: Readers will gain insights into the personal side of Steve Jobs, his relationship with creativity and technology, and the impact that his life and work had on others. The memoir also sheds light on the challenges and complexities of balancing personal and professional relationships.

Q: Why is Chrisann Brennan's memoir considered an important contribution to the understanding of Steve Jobs? A: "The Bite in the Apple" fills a significant gap in our understanding of Steve Jobs' life and work. It provides a firsthand account of his early relationship, his personal struggles, and the formative experiences that shaped his character and career. Through Chrisann's narrative, readers gain a deeper appreciation of the visionary leader and the complex human behind the legend.

The Rock Says: A Q&A with WWE Legend Dwayne Johnson

Q: What was the inspiration behind your iconic catchphrase, "The Rock says"?

A: I wanted to create a phrase that was simple, catchy, and unforgettable. I chose "The Rock says" because it's short, easy to remember, and it gives me power and authority over the crowd.

Q: How did your catchphrase become so popular?

A: I started using it during my days in the Nation of Domination and it quickly caught on with the fans. People loved how it made me sound like a powerful leader and it helped me connect with the audience on a personal level.

Q: What is your favorite memory associated with your catchphrase?

A: My favorite memory was when I was in the ring with Stone Cold Steve Austin and was giving him a promo. I said, "The Rock says your chances of beating me at

WrestleMania are slim to none." The crowd erupted in cheers and it was a moment that I will never forget.

Q: How did your catchphrase impact your career?

A: My catchphrase played a major role in my success in the WWE. It helped me establish myself as a top star and it allowed me to connect with millions of fans around the world. It's something that I'm proud of and it will always be a part of my legacy.

Q: Do you still use your catchphrase today?

A: Yes, I still use my catchphrase occasionally. I've even incorporated it into some of my movies and TV shows. It's a part of who I am and it's something that I will always be known for.

These Broken Stars by Amie Kaufman and Meagan Spooner: A Captivating Space Opera

What is These Broken Stars about?

These Broken Stars is a thrilling space opera that follows the story of Lilac LaRoux, an upper-class girl from the luxurious planet Ixia, and Tarver Merendsen, a hardened soldier from the war-torn planet Minor. After a catastrophic accident leaves their spaceship stranded on a hostile planet called Carthago, they must overcome their differences and work together to survive.

Who are the main characters?

Lilac LaRoux is a sheltered and privileged young woman who must learn to adapt to a dangerous and unfamiliar world. Tarver Merendsen is a skilled fighter and strategist who has seen the horrors of war firsthand. Together, they form an unlikely alliance that is tested by the challenges they face.

What is the setting of the novel?

The novel takes place in a vast and unexplored galaxy, where humanity has colonized numerous planets. The story unfolds primarily on the planet Carthago, a barren and desolate world covered in dense forests and deadly predators.

What are the major themes of These Broken Stars?

The novel explores themes of survival, sacrifice, and the power of love. Lilac and Tarver must learn to rely on each other and overcome their prejudices to stay alive. They also discover the strength of their connection, which grows stronger as they face danger together.

Is These Broken Stars a good read?

Yes, These Broken Stars is a highly acclaimed and compelling novel. It combines fast-paced action, suspenseful plot twists, and well-developed characters. Readers who enjoy space operas, science fiction, and stories of survival will find it an unforgettable experience.

[the bite in apple a memoir of my life with steve jobs ebook chrisann brennan, the rock says, these broken stars by amie kaufman meagan spooner](#)

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