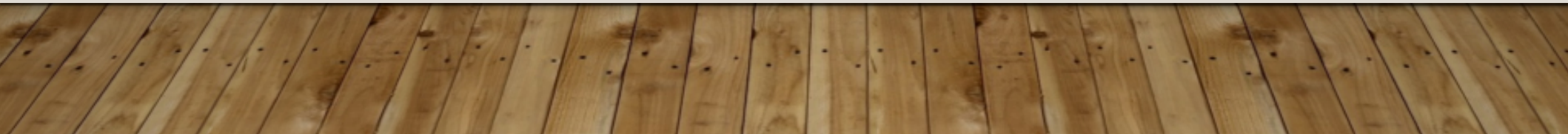


# CAVIATER

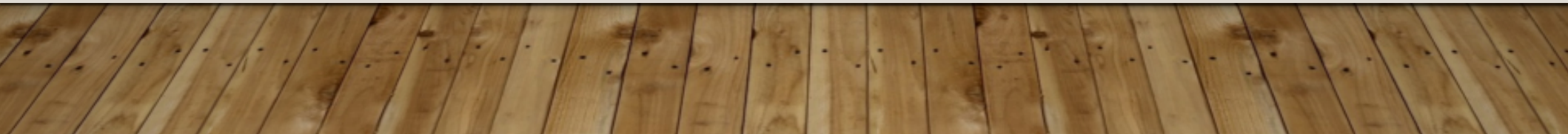
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SONOCHEMISTRY USED IN PAINT APPLICATION



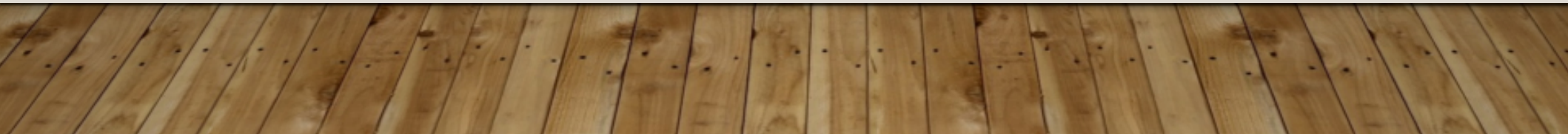
PATENTED PROCESS ON PAINT  
APPLICATION PATENT REG. NO  
201821049773A

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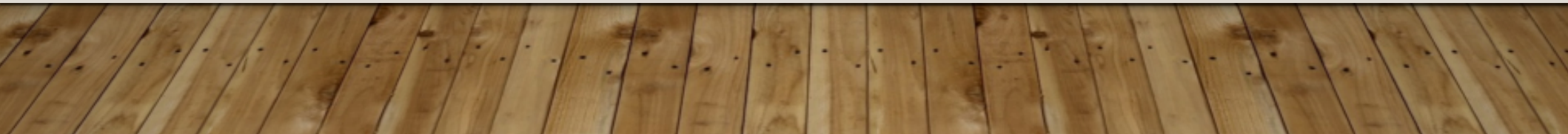
# Sonochemistry

- ❖ **Application of power of sound to chemical processes;**
  - Ultrasound can increase chemical reactivity besides heat, pressure, light & catalyst.
  - Chemical changes by power of ultrasound @ lower frequency as a result of generated cavitation.



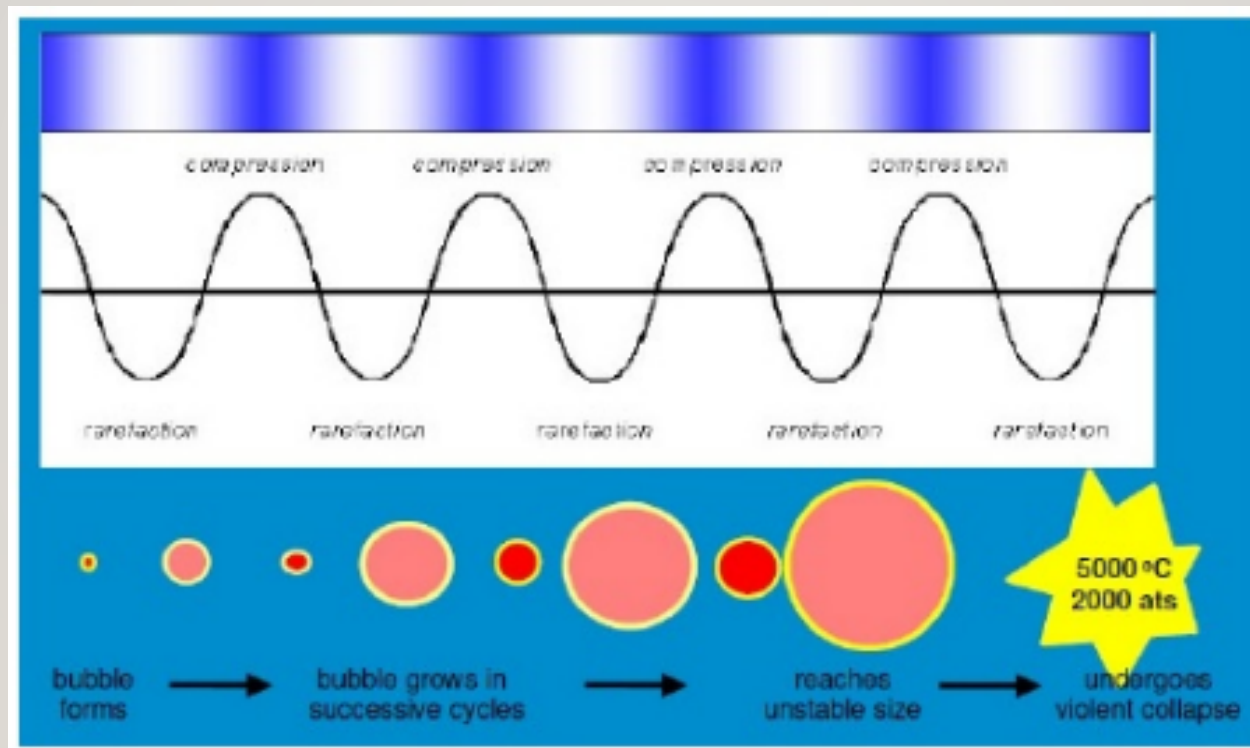
# Cavitations

- Formation, growth & implosive collapse of bubbles in liquid.
- Cavitation collapse produces intense local heating ( $\sim 5000\text{K}$ ), high pressures ( $\sim 1400\text{ atm}$ ), enormous heating & cooling rates ( $\sim >10^9\text{ }^\circ\text{K/sec}$ ) and liquid jet stream ( $\sim 400\text{ km/hr}$ ).



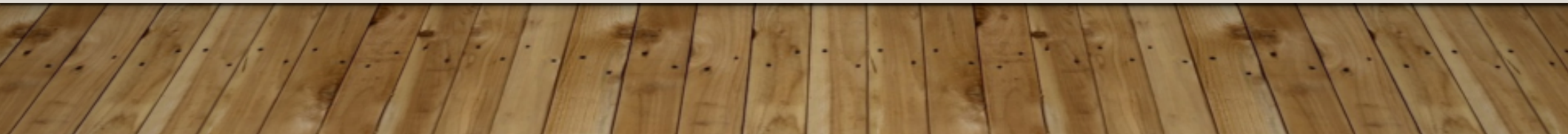
# Cavitations

Illustration of bubble generation and collapse.



# Occurrence of cavitations

- Within the bubble itself which can be thought of microreactor.
- In liquid region immediately adjacent to bubble where the temperature are not so great
- In the immediate vicinity of bubble when shockwave produce on collapse will create enormous shear force.





# Sonochemistry apparatus

In Lab / development :

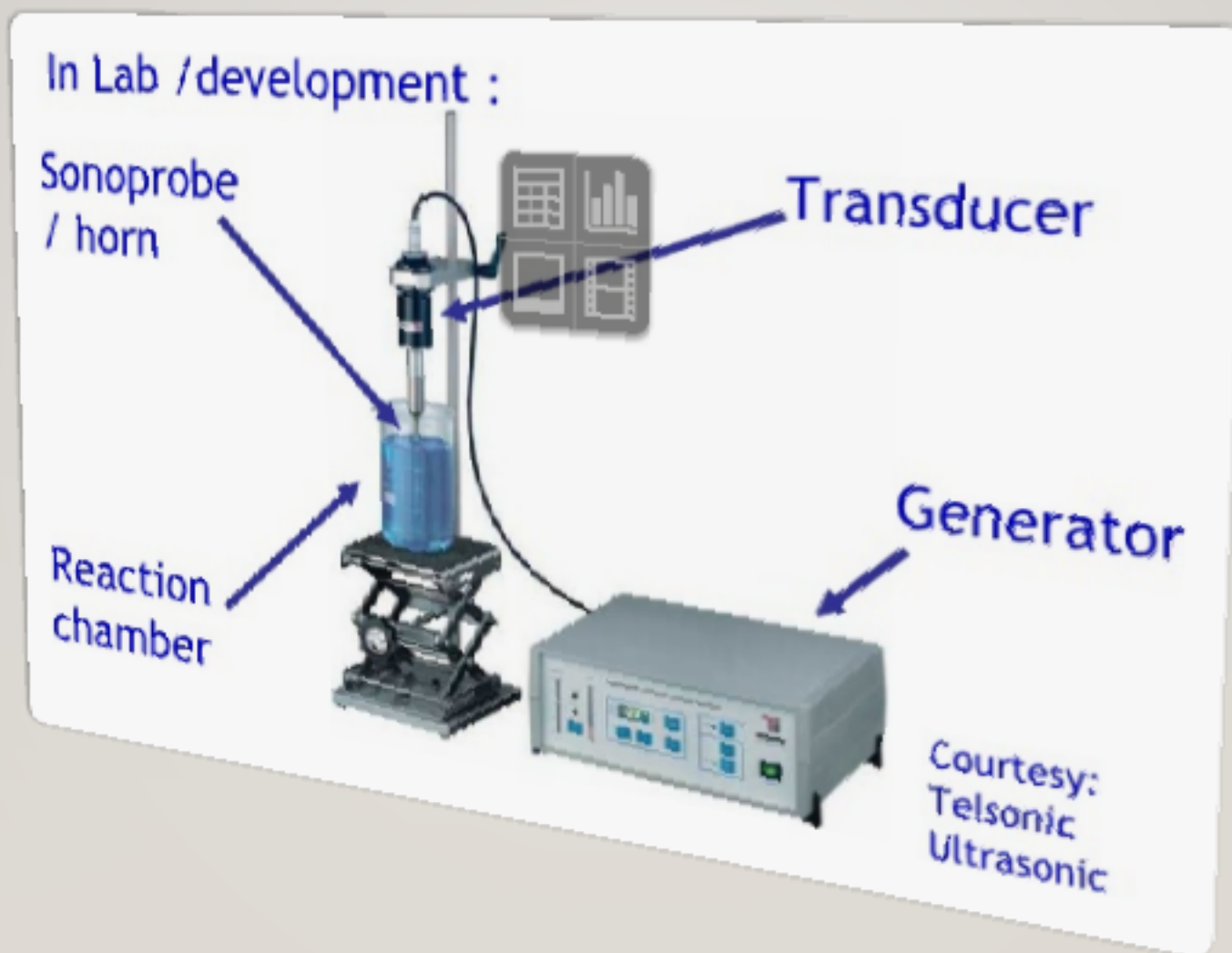
Sonoprobe  
/ horn

Transducer

Reaction  
chamber

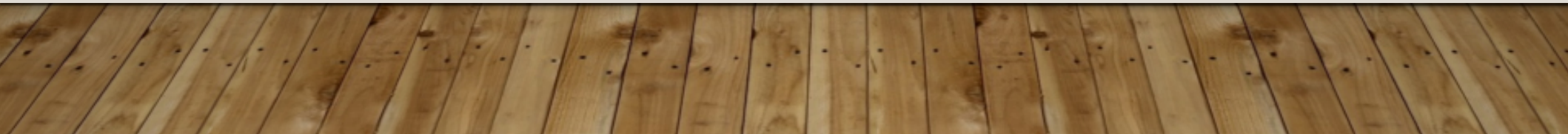
Generator

Courtesy:  
Telsonic  
Ultrasonic



# Effects of Ultrasonic Cavitation

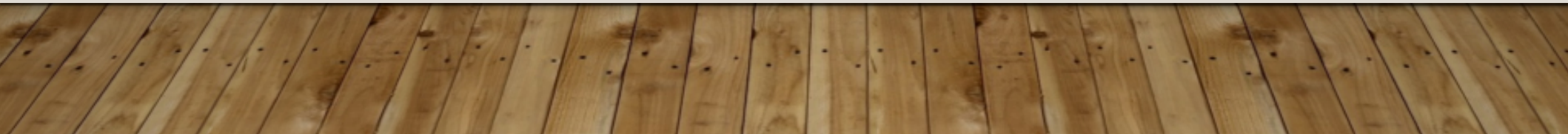
- ❖ Gloss of paint increase
- ❖ Even distribution of pigment particles
- ❖ Paint hiding improves
- ❖ Surface area covered by the paint is more
- ❖ Improve quality of less skilled painters
- ❖ Higher **DOIG**
- ❖ Controlled formation of orange peel





# Effects of Ultrasonic Cavitation

- ❖ Transfer efficiency increase
- ❖ Reduce flash off timing
- ❖ Reduces overspray & rebounding
- ❖ Elimination of wait time between 1<sup>st</sup> coat & 2<sup>nd</sup> coat
- ❖ Improve color matching
- ❖ 100% control delivery
- ❖ Solvent intake reduces 50-100%



# Effects of Ultrasonic Cavitation

- ❖ Reduces VOC emission
- ❖ Eliminates all the major uncontrollable variables in spraying
- ❖ Extends life of booth filters & less maintenance of spray booth
- ❖ Ease of leveling
- ❖ Degassing of resin, reduces popping
- ❖ Elimination of mottling
- ❖ Reduces application time 25-50%

