CHEMICAL REACTION RULE UNDER RULES OF ORIGIN- Proposal by Australia

Australia has tabled the proposal for using the process-based rules, as co-equal rules (along with CTC or RVC) to determine origin. More particularly, it has propounded that for **goods classified in Chapters 27 to 40 (which include mineral fuels, chemicals, plastics and rubber),** the PSRs, in addition to containing co-equal CTC and RVC rules for individual tariff lines, need to provide for alternative process rules – ***'chemical reaction rule'*** which will apply across the chapters. These rules allow any good which is produced as a result of a specified process of production to qualify as an originating good, regardless of the source of the materials used to produce it.

The details provided by Australia about the chemical reaction rule- its applicability; advantages as well as issues regarding verification are summarized as under:

A chemical reaction rule is one production process rule that can demonstrate substantial transformation across a number of different chapters and goods. It is defined as "a process (including a biochemical process) which results in a molecule with a new structure by breaking intramolecular bonds and by forming new intramolecular bonds, or by altering the spatial arrangement of the molecule".

If a chemical reaction results from the combination of non-originating materials, then the good produced from the reaction is eligible for preferential treatment without having to meet the CTC or RVC rule for the good provided the chemical reaction is provided as an alternative PSR. If a chemical reaction does not result from the combination of the materials the good is eligible for preference only if it meets the CTC or RVC requirement of the relevant PSR.

According to Australia, a chemical reaction rule for conferring origin has **a number of advantages** for businesses compared to other PSRs. First and foremost, the processes involved in meeting chemical reaction rules are **well understood by industry, simple to administer and have a lower administrative burden**. Chemical reaction rules are also more **stable and predictable**, for the rule provides essential safeguard to producers against price fluctuations in the world market due to which proving the RVC requirement becomes difficult. The chemical reaction rule also has the benefit of **consistency**. Regardless of the cost of materials, labour and other inputs, if the same process is followed, then the good will always be conferred origin.

Further, Australia has also pointed out that chemical reactions for manufactured products typically involve significant capital, equipment and skills, and when applied to the appropriate goods will ensure that substantial processes have been undertaken in production. As such, there is a low risk of transshipment or fraudulent claims using chemical reaction rules, and no incentive to undertake a chemical reaction merely for the purposes of claiming origin. Chapter notes typically include a qualifier to ensure minimal processes do not confer originating status and to guarantee that substantial transformation takes place.

In addition, Australia proposes that the following are not considered to be chemical reactions for the purposes of determining whether a product is an originating good:

a) dissolving in water or other solvents;
b) the elimination of solvents, including solvent water; or
c) the addition or elimination of water of crystallization.

Presently, the chemical reaction rules are provided in the ASEAN Australia New Zealand Free Trade Area, but apply only to Chapters 28, 29 and 32, and can only be used if the good does not meet alternative change in tariff classification or regional value context rules. **Under the Regional Comprehensive Economic Partnership (RCEP), Australia proposes that the chemical reaction rule would be available as a co-equal alternative rule to any other applicable change in chapter (CTC) or regional value content (RVC) product specific rules (PSRs) for these goods. This would allow industry to choose which PSR to apply.**

As regards the verification of the chemical reaction rule, Australia proposes the following options for securing the supporting evidence by the importing customs authorities:

i. Report from an advance ruling on the origin of the goods.
ii. Report from previous verification visits.
iii. Evidence of the purchase or manufacture of inputs, including the chemical and physical composition of the inputs.
iv. Evidence of production process, including whether the manufacturer operates the required processing facility for the chemical reaction.
v. Documents supporting product specifications of the final good, including chemical or physical analysis.
vi. Registered patents (Businesses leading innovation and use of new technology).
vii. Certified quality manual and quality assurance certification; and associated audit reports.
viii. Declarations from field experts, e.g. chemist.
ix. Certified laboratory test results.
x. Export licences/permits.
xi. Information regarding the sale of the good, including the intended use of the product sold.

Examples of common chemical reaction that could be included under the chemical reaction rule, as provided by Australia are have been placed in the Annex.

Observations of the Department of Commerce: There is no provision of the chemical reaction rule under any of India's existing FTAs. The proposal on chemical reaction rule under Rules of Origin has been solely mooted by Australia. However, countries like Thailand have already expressed their concerns over the same. Further detailed discussions are scheduled to be held on Australia's proposal in the future rounds of RCEP negotiations.

ANNEX

EXAMPLES OF COMMON CHEMICAL REACTIONS

Final good	Materials	Origin Criteria – Chemical Reaction	Comments
Sulphuric Acid	Water Sulphur	Chemical reaction $S(s) + O_2(g) \rightarrow SO_2(g)$ $SO_2 + ½O_2 \rightarrow SO_3$ $SO_3 + H_2O \rightarrow H_2SO_4$	Sulphuric acid is one of the most widely traded and used chemical products. Sulphur could be imported, and reacted with oxygen, heat and a catalyst to confer origin. A catalyst has no effect on the reaction or final products and simply speeds up the reaction. The origin of the sulphur or the catalyst should not be relevant to determining origin. The capital, equipment and skills that are required to produce the chemical reaction for sulphuric acid are very substantial and the transformation is sufficient to confer origin.
Fertiliser (Super phosphate)	Sulphuric Acid Water Phosphate rock	Chemical reaction $2Ca_5(PO_4)_3F + 7H_2SO_4 + 3H_2O \rightarrow 7CaSO_4 + 3Ca(H_2PO_4)_2$ $.H_2O + 2HF$	Typically, fertilizers are composed of nitrogen, phosphorus, and potassium compounds. They also contain trace elements that improve the growth of plants such as calcium, magnesium, manganese, zinc, molybdenum, and boron. Fertilisers also contain stabilisers and additives to improve the transport and storage of the goods. Fertilisers have a highly complex production process with an extensive number of inputs that fluctuate in price and source country. A chemical reaction rule would be of significant benefit to producers. Instead of having to determine the origin of every input for a CTC rule or constantly recalculate an RVC with every change in price, the fact that the producer has undertaken a chemical reaction on these diverse products would be sufficient indication of substantial transformation that confers origin.
Paint (Poly urethane)	Alcohol - toluene diisocyanate (TDI) Difunctional isocyanate Stabiliser	Chemical reaction HO R OH + O C N R' N C O $\rightarrow$ HO R O C	Polyurethane paint is linear polymer made through a chemical reaction between a diisocyanate and a polyol. The chemical reaction of polymerisation is undertaken in a reaction vessel and can include a variety of raw materials: monomers, prepolymers, stabilizers, colorants,

	(hydroxybenzotriazol)	NH R' N C O O	pigments, solvents, levelling agents, thickening agents, catalysts and other modifiers included to enhance the coating. Polymerisation is the process of joining together a large number of small molecules to make a smaller number of very large molecules. There are two main polymerisation reaction processes: addition (monomers are rearranged without the loss of any atom or molecule) and condensation polymerisation (a molecule, usually water, is lost during the formation). Both processes require substantial investments in equipment and engineering/chemical expertise. The origin of the materials should not be relevant to confer origin as the polymerisation process is sufficiently substantial.
Ricon 153 (Rubber)	Solvent Butadiene	Chemical reaction	Polybutadiene is a synthetic rubber that is a polymer formed from the polymerization process of the monomer 1,3-butadiene. It is the second largest synthetic rubber produced globally. But as the polybutadiene resin is classified to chapter 39 and was produced via a chemical reaction, the chemical reaction rule applies. The final good is therefore originating. The production processes of high and low cis polybutadiene[1] can be quite different. However both require substantial capital equipment and skills to undertake the substantial chemical reaction process. For example, a typical production process involves the solvent and catalyst being charged to the reactor and then heated. The polymer solution is then transferred to another vessel or process unit to remove the solvent. The monomer, solvent and catalyst are continuously fed into the bottom of the first of a series of reactors at a temperature suitable for polymerization. See figure A for example of a production plant.

[1] In terms of the connectivity of the polymer chain, butadiene can polymerize in three different ways, called *cis*, *trans* and *vinyl*. The cis and trans forms arise by connecting the butadiene molecules end-to-end, so-called 1,4-polymerisation. "High cis"-polybutadiene has a high elasticity, which is characterized by a high proportion of *cis* (typically over 92%) and a small proportion of vinyl (less than 4%), and is useful in tire manufacturing. Using an alkyllithium (e.g. butyllithium) as the catalyst produces a polybutadiene called "low *cis*" which typically contains 36% *cis*, 54% *trans* and 10% vinyl and is generally not used in tire manufacturing.

Plastics compound	Compounding ingredients such as colourants, processing aids, flame retardents, stabilisers Base polymer	Compounding rule	Compounding consists of preparing plastic formulations by mixing or/and blending polymers and additives in a molten state. These blends are automatically dosed with fixed set points usually through feeders/hoppers. Compounding is typically the first step in plastic fabrication procedures It involves a mixing or blending (including dispersion) process and can be carried out with a range of base polymers depending on the intended end use of the compound. For example, specific compounds are produced for pipe manufacture, cable manufacture and for rotational moulding. One example of the process can involve linear low density polyethylene (LLDPE) resin in granular form combined with small but crucial quantities of coloured master-batch and in some cases, other additives as mentioned above. The end product is sensitive to variation in proportions, the add rate is relatively small and needs to be carefully monitored plus by the end of the extrusion stage of the process the product needs to be combined to a homogenous blend.